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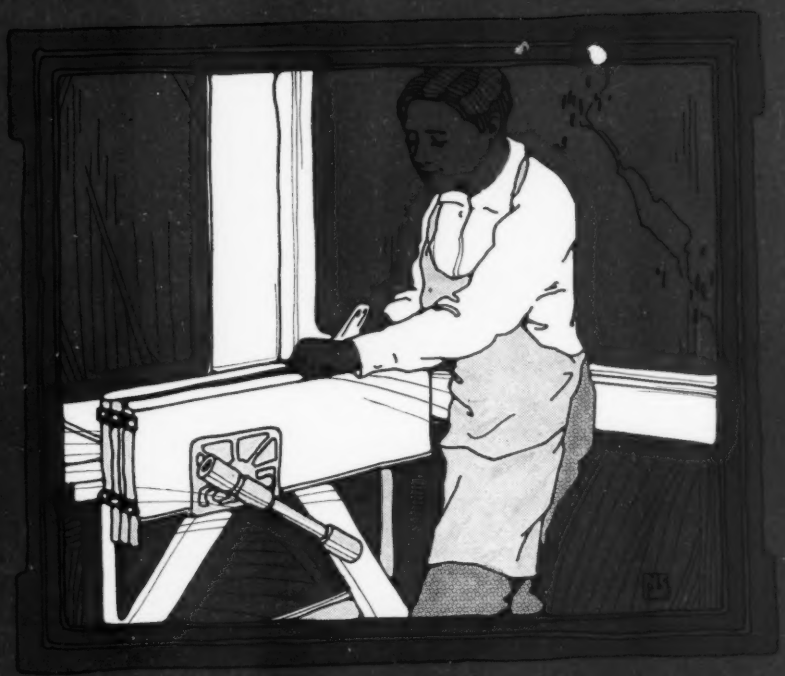
The Industrial-Arts Magazine



OCTOBER-1924

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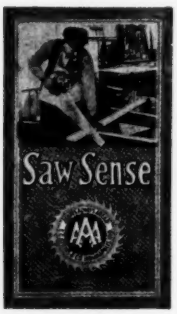
Milwaukee Wis.

ATKINS
SILVER STEEL SAWS



"Saw Sense"
Contains valuable information on roof framing, shingling and care of the saw.

"How to Care For and Use Cross Cut and Hand Saws"
Explains how to fit up cross cut saws, band saws and wood saws so they will give best results.

We will furnish these booklets for your entire class

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Four complete lessons accompany this saw, telling how it can be used to teach your pupils the correct methods of setting and filing hand saws.

We have had so many requests for our demonstrating saws and educational saw literature that we have decided to repeat our offer and give everybody an opportunity of securing the literature and the loan of a demonstrating saw. Write at once on your school stationery.

We can furnish for your classes carpenter aprons with a carpenter pencil included for 35c.

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INDUSTRIAL-ARTS MAGAZINE

Volume XIII OCTOBER, 1924 No. 10

EDMUND KIRBY SMITH JUNIOR HIGH SCHOOL, JACKSONVILLE, FLA.

Industrial Arts in the Junior High School at Jacksonville, Fla.

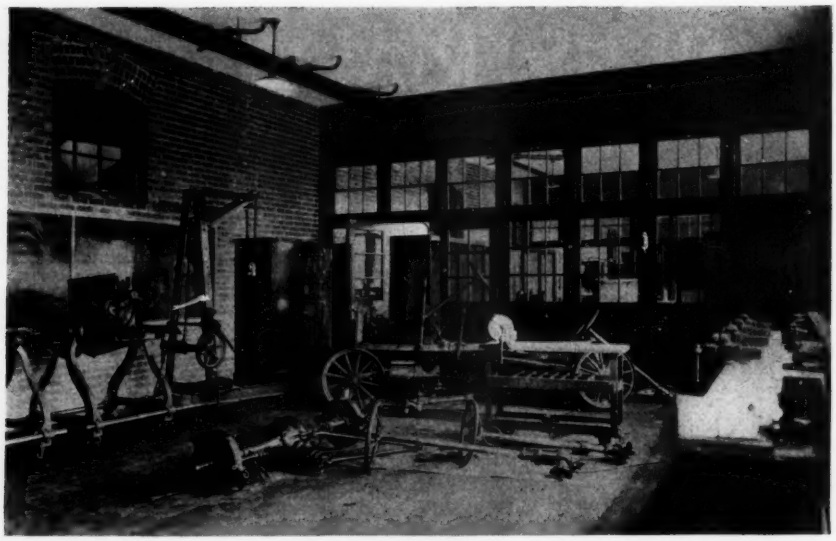
Mr. R. G. Sawyer, Director of Vocational Work.

THE BOARD of Public Instruction of Jacksonville, Florida, has recently opened two modern junior high schools. These schools are located in the centers of school population; one housing about thirteen hundred pupils, and the other about one thousand pupils. These buildings are exact duplicates, which means not only a saving in cost of working out the plans, but makes it easier in the organization of the work in the two schools.

Each of these buildings is built around an inclosed court with all classrooms on the outside. Each building is three stories high in the center with two stories on the two sides. One delightful feature of the buildings is that there are no classrooms of any description in the basement. The ground floor front comprises the general office, food room, clothing room, commercial rooms, and the girls' shower bath; the right side, the auditorium; and the left side, the gymnasium. This gymnasium has a folding partition in the center, which divides the one large gymnasium into two smaller ones—one for boys, and one for girls. At the rear of the building is found the boys' shower room, the print shop, the wood shop, the electrical shop, the automobile shop, the general metal shop, and the mechanical drawing room. The second floor of the building is made up of some classrooms and some special rooms, such as science, art, library, etc. The third floor is entirely academic classrooms.

The general curricular scheme is one of constants and variables. All students are required to take the constant program in the seventh grade, which includes a try-out, or rotation, of courses in the subjects which are to be elected. In the eighth grade students must carry a certain number of required constants and may elect one variable along the lines which they wish to pursue. In the ninth grade students are required to take fewer constants and are given two variables. As the work develops it is hoped to have a completely developed vocational guidance program. At present students are grouped into fast, medium, and slow groups. The work in all classes is given so that the fast, medium, and slow pupils in each group are properly cared for. Wherever possible, all classes are conducted along lines of the socialized recitation. Inter-curricular activities are carried on in a great many subjects.

The industrial department is of direct interest to readers of the INDUSTRIAL ARTS MAGAZINE, and affords an example of adaptation of shops and equipment to a definite program of industrial-arts and pre-vocational education. As the schools are new, the complete program, which we have in mind cannot be put into full operation, but steps are being made to fast work out the desired program. In the seventh grade, during this



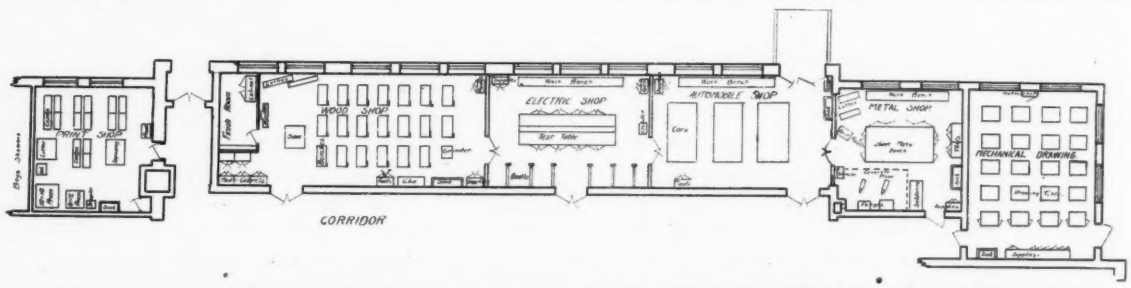
THE AUTOMOBILE SHOP.

preliminary organization, the industrial department is allowed only two 55-minute periods each week. The pupils rotate during the seventh grade on a nine-week's rotation through four subjects; namely, woodworking, electrical work, general metal work, and mechanical drawing. This makes the time-allotment very short, there being only sixteen 55-minute lessons for each subject. In the eighth grade students in the industrial department may elect that department as a whole, but are not allowed individual elections at first. One reason for doing this is that we feel that the students have not had enough mechanical drawing in the seventh grade, that there are some of the courses which the students should take as a prerequisite to more advanced work, and there are still some try-out courses to be experimented with before allowing individual elections. In the ninth grade students are allowed to elect individual subjects. In the eighth and ninth grades students are allowed five 55-minute periods weekly. It is hoped that, as the schools become more completely organized, students may be allowed to elect two 55-minute periods weekly in the shops in the ninth grade, if they so desire. There is also a plan on foot to establish a vocational school to which boys may be transferred from the junior high school after trade selection has been definitely determined upon. In this school more time will be allowed shop subjects.

The shop arrangement is ideal, in that the four closely allied mechanical shops are so arranged, as will be noted by the layout, that all four shops may be connected and controlled by one man if it should be found necessary. The shops are separated by all-glass partitions and double doors. However, we do not anticipate the need of one man handling more than two of the shops at one time, and then only with small groups. This arrangement also allows students working on a model, which might require a variety of processes, to use tools, etc., in any or all of the shops as they may be needed in working out a model. This arrangement is especially valuable for the ninth grade students who may be working on large and complicated models. The drawing room and print shop, which are more or less individual as to their type of equipment, are entirely separate from the other shops. Each shop is planned to care for twenty students, but a few extra may be accommodated with ease.

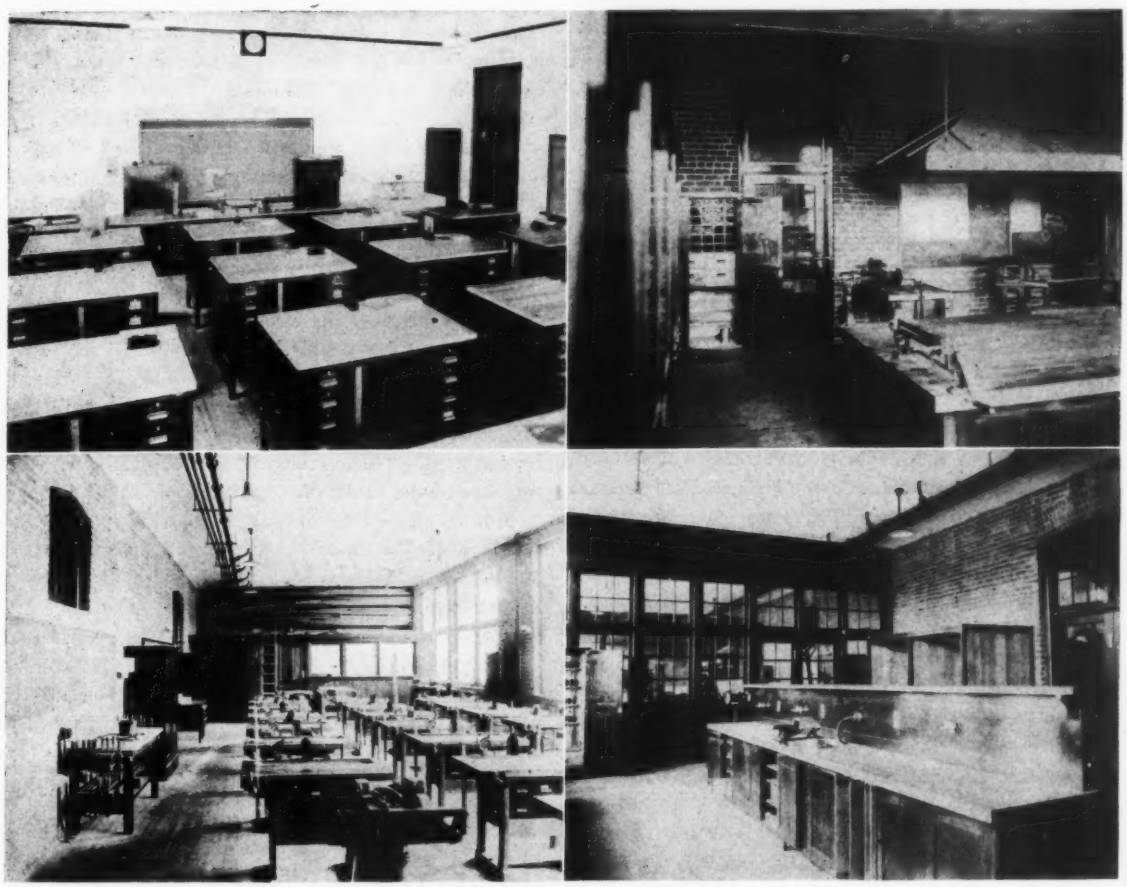
The woodworking shop is equipped with twenty benches, one circular saw, one six-inch jointer, two turning lathes, one grinder, a finishing room, a lumber rack, glue bench, tool cabinet, supply cabinet, six model cabinets, and the necessary hand tools. The room arrangement and cabinets are shown by the accompanying cuts.

The electrical shop has six booths for large wiring



GENERAL FLOOR PLAN OF THE INDUSTRIAL ARTS SHOPS OF THE JUNIOR HIGH SCHOOLS AT JACKSONVILLE, FLA.

problems, a work bench, a supply table and test rack, a supply cabinet, a tool cabinet, and a grinder. The supply table and test rack has duplicate arrangements on each side. It has drawers at each end for various materials, a compartment of small drawers for various fittings, a compartment with large shelves for wire and metal and supply bench with a former, folders, stakes, and small burring machine mounted on it; a special soldering bench, a grinder, a double tool cabinet, and a supply cabinet. This shop presents a hard teaching problem as the boys must rotate through these four activities in the short time allotted in the seventh grade.



TOP: MECHANICAL DRAWING ROOM; METAL SHOP.
BOTTOM: WOOD SHOP; ONE CORNER OF ELECTRIC SHOP, SHOWING BOOTHS, GRINDER, TOOL CABINET, AND TEST TABLE.

such material, and a compartment for twenty drawing boards which are used for the elementary wiring problems. The tool cabinet has such tools as: twenty rules, twenty screw drivers, twenty pliers, twenty knives; with general tools, such as hammers, large and small screw drivers, hack saws, reamers, pipe vise, stocks and dies, enunciators, bells, buzzers, and telephones.

The automobile shop is equipped with a work bench, tool cabinet, supply cabinet, grinder, floor crane, portable work bench, two continental motor stands, jacks, portable electric drill, and a complete set of hand tools. The floor space allows for three cars.

The general metal shop is not ideal because of the variety of activities and the smallness of the room, but for the preliminary try-out courses and the possible few elections in that department, it was thought best to arrange the room in this manner. It has in its equipment two small lathes, one drill press, a work bench; a

The mechanical drawing room has twenty drawing tables, each with twelve individual drawers and twelve spaces for boards, a large supply table with six compartments shelved in such a manner so that each boy may have a place to keep his finished drawings and surplus paper. This large supply table also has a cabinet for the storage of models, large and small drawers for supplies, and one large cabinet for the storage of paper. In this room there is an instrument cabinet with a glass door and slanting shelves so that all the drawing instruments are visible at all times for easy checking. The small equipment for the room includes twenty sets each of instruments, tee-square, 45-degree triangles, 60-degree triangles, scales, and books.

The print shop was not equipped this year, but will be next year. The working out of these small unit rotation, or try-out, courses, especially for the seventh grade where the time is so short, has been somewhat of a task.

STANDARD TOOL CABINET USED IN ALL SHOPS.

We desired that these courses have plenty of interest, a good idea of the work, and some general information and guidance. The teachers have responded faithfully, and successful short units are being conducted which we feel are of value. At the present time the short unit courses are being given to all grades, as these pupils heretofore have done only woodwork. The general aim of these short rotation courses is to give to all boys a general elementary mechanical training, a knowledge of various tools and materials, and to form a basis for future vocational selections. We feel that it is as necessary for a pupil to know what not to choose, as to know what to choose. Each course is arranged so that the slow boy and the fast boy is taken care of. The advanced courses for the boys making individual elections are not completed, but will be ready for the fall term when the first individual elections occur.

The course for the woodworking shop is planned so that all boys will begin with a small model to be worked out at the benches. After this model is started, two boys are sent to the wood lathe, for two days' work; and several boys are put to work on home mechanical problems. Because of the short time and the rotation it was decided to work out a series of models, each having a large back piece of the same size. It was also decided to have several different patterns worked out for each type back piece, the first process being to smooth the surfaces with the plane. As this work progresses, the faster boy and the slower boy begin to lead or to fall behind. Thus when it becomes time for the selection of the type and design of model preferred, the teacher has some little knowledge of their ability and allows the selection accordingly.

The models decided upon for the bench work were small tie-racks, towel holder, broom holder, milk bottle holder, pipe racks, tooth brush racks, and sconce, etc. The model for the lathe work was a small, very shallow pin tray, the work to be done on the face plate with the round-nosed tool. The several home mechanics problems are re-screening a frame, removing a lock, taking a door off its hinges, sharpening a knife, sharpening and adjusting scissors, and puttying a window. In the working out of a bench model, the exact sizing of stock is not done by the boy, but merely the smooth planing of the two surfaces, the curved work on the edges being done with the chisel.

During the course the boys are required to read upon such subjects as growth and grain of wood, the lumber industry, various hardware and finishing materials, with the idea of making a report either verbally or in writing on same. Each boy is supposed to complete the bench model, the turning model, and the home mechanics exercises.

The course for the electric shop covers safety first and danger, a few simple bell wiring problems, battery connections, making of common joints, the soldering and taping of these joints, and some home mechanics problems, such as putting in new fuses, making an extension cord, replacing switches or receptacles, with possibilities of the faster boy making some small electrical apparatus. The general aim of this course is to give boys a general idea of electrical work, some ability to do small repairs around the house, and a knowledge of the materials handled.

The automobile course covers the tearing down and assembly of the parts of an automobile, this to acquaint boys with the handling of the necessary tools and the names of the parts, also a study of what parts need

STANDARD SMALL SUPPLY CABINET USED IN BOTH JUNIOR HIGH SCHOOLS.

special attention, and where breakage, or failure, of operation is likely to occur. The aim is not to learn repairing but to get a general idea of the automobile and its parts. There are several problems, which we call home mechanics and which the boy is expected to do. These include testing the lights, testing ignition, cleaning spark plugs, cleaning battery terminals, testing a battery, adding water to battery, and where and how to lubricate. These latter problems are problems which the boy should be able to do on his own car.

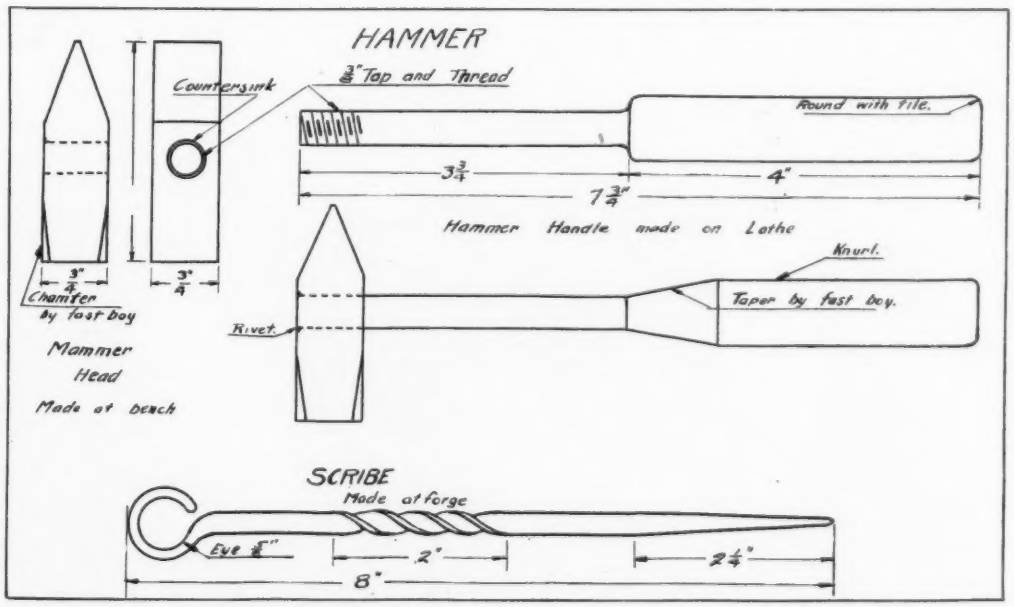
The metal shop required more work in devising a course than any of the others. The boys in this shop are required to do some forging, some sheet metal work, some bench metal work, and some lathe work. The boys at the forge make a small scribe, which requires the flattening of stock, drawing out and bending an eye, drawing to a point, and twisting. Those at the sheet metal bench make a small cooky cutter, which brings in the use of the folder, the former, and the soldering iron. At metal bench, the head for a small rivet hammer is made and the boys on the lathe turn out a small steel handle to fit into the head. The aim of this course is to give the boy some general idea of these processes, and an idea of the metal and materials used in making them, also to serve as a guidance basis.

It has been decided that all boys entering the seventh grade should get some drawing, some electrical work, and some general metal work, before being allowed to take automobile work. We believe that by arranging the rotation in this manner, the boys would be better equipped to enter the automobile shop than they would without having had those practices.

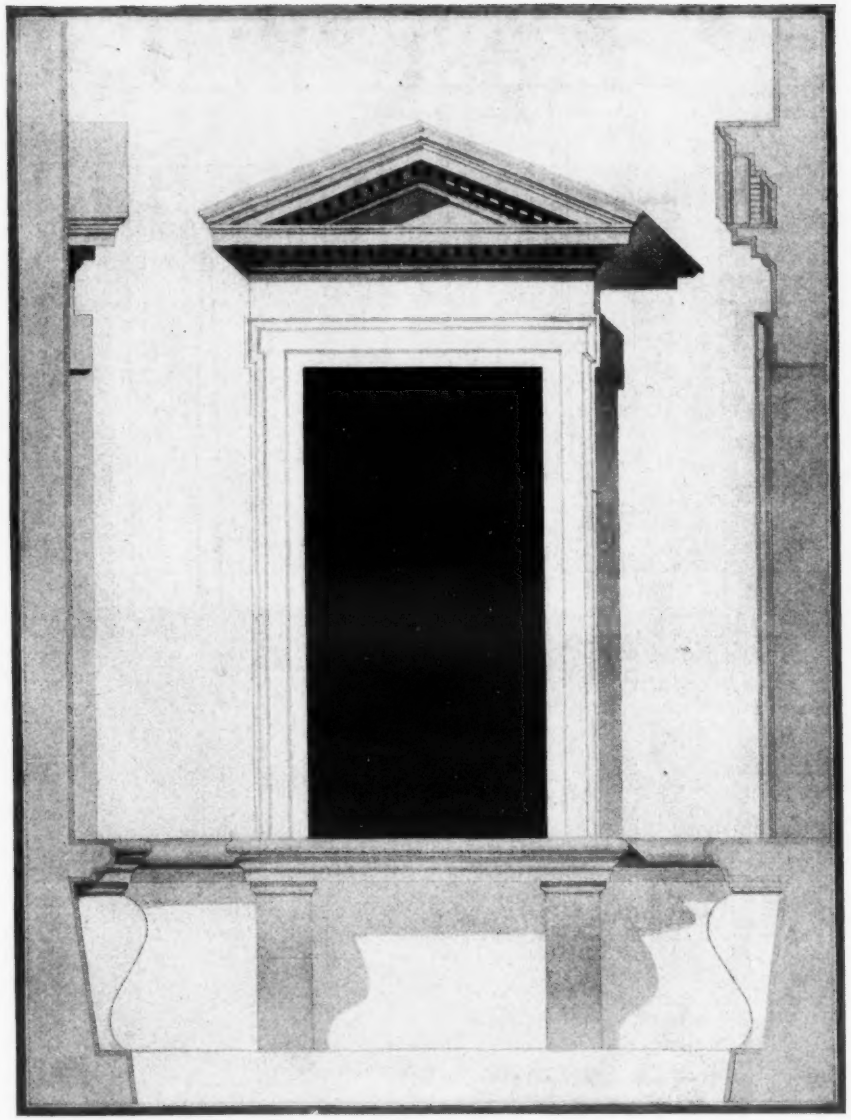
A CORNER OF THE METAL SHOP.

At the present writing the first rotation of these courses is completed, and the courses as outlined are proving quite satisfactory. Several slight changes in the design and methods of working the problem have been made in order to finish within the time allotment, but the general idea and the amount of work remain practically the same. For instance, it was found that the cooky cutter was too easily made, while the handle for the hammer as laid out, required the removing of too much material, also the problem for the turning lathes in the wood shop needed to be made more simple to allow a suitable finish.

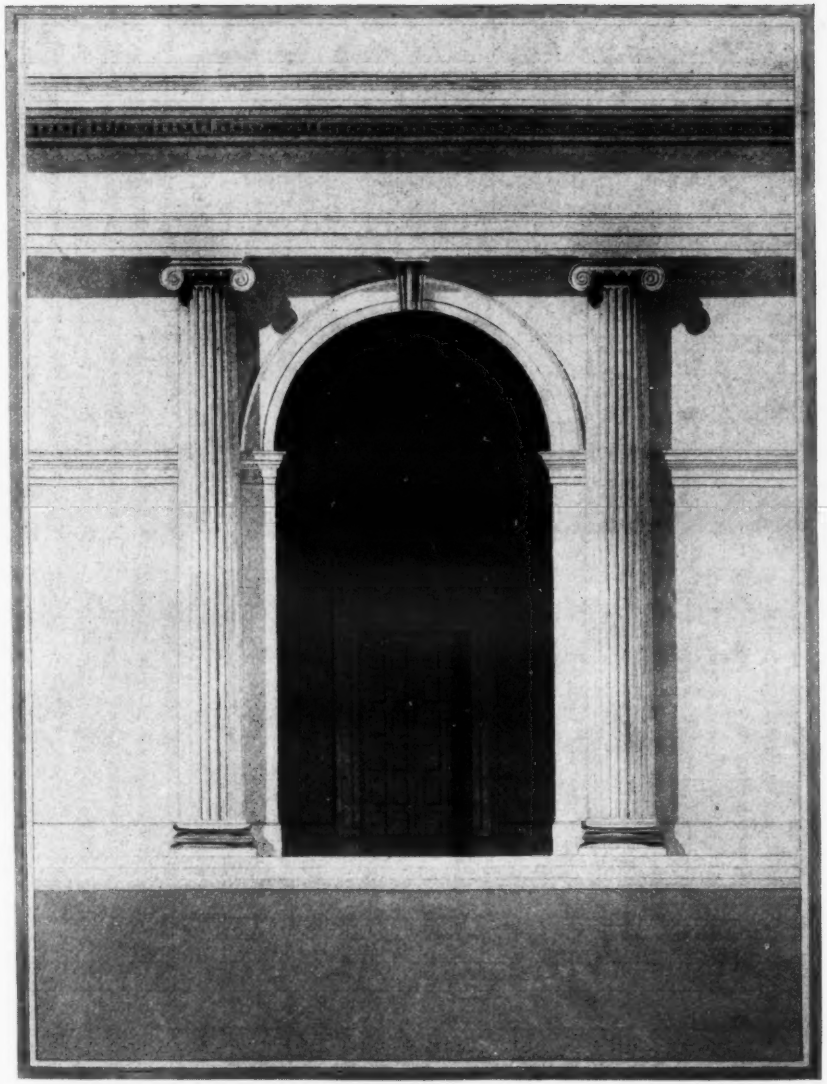
The tool cabinets and the supply cabinets, as shown by the accompanying cuts, are standards in all shops.



TWO OF THE METAL WORK PROBLEMS USED IN THE JACKSONVILLE JUNIOR HIGH SCHOOLS.



A CLASSIC WINDOW. STUDENT'S DRAWING, MIAMI, FLA., HIGH SCHOOL.
(Original Wash, 20" by 32".)



A STUDY OF IONIC DETAILS. STUDENT'S DRAWING, MIAMI, FLA., HIGH SCHOOL.
(The original wash measured about 15" by 20½".)

The Course in Architectural Design in the Miami High School

Robert F. Smith, Head of the Department of Architectural Drawing, Miami, Fla.

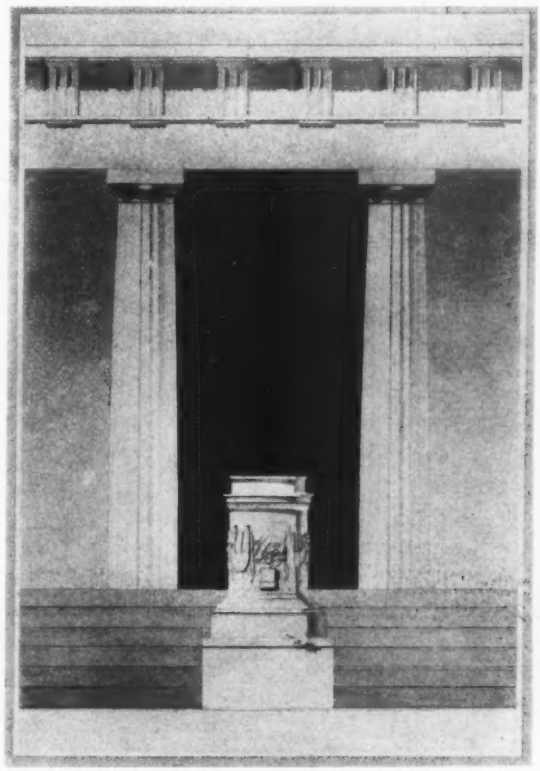
DO YOU have to drive your architectural students to work or do you have to literally drive them away from the drawing room at 5:30 or 6 o'clock every day? Is the course you are offering fitting the student who is serious architecturally for his future and also satisfying the girl who is taking it as a cultural subject and may never see an office, but who wants to know how a home should be planned and be able to understand the reading of architects' plans? Yes, it can be done in one class, with practically the same course outline and the same projects.

Students desiring this course should come to us with a knowledge of orthographic projection, isometric, and perspective. It is a hardship on the instructor in architecture to be compelled to teach mechanical drawing. We have found that a student of mechanical drawing for one or two years is not spoiled for architectural drawing, but an instructor is spoiled if he thinks in terms of mechanics instead of considering architecture as an art.

The Department of Architecture of the Miami High School was started three years ago because of the need presented by the students, many of them the sons and daughters of architects, contractors and builders of this fast growing community. Gradually we are building up this course to the point where a student graduating from the four years' course has the knowledge to design and figure on residences and small public and business buildings.

The problems are given to the students in the form of "programs." In this respect the system is very much like the series of "programs" issued by the Society of Beaux Arts Architects of New York City in their work among the colleges and ateliers throughout the country. Each program is eagerly waited for by the students because of the spirit of competition which enters their work. These programs are issued each month and students are at liberty to select any of them. In this way the programs become optional with the students, and they literally choose their own course, making the amount of credit they can carry, depend upon the number of periods devoted to the work. We do require, however, that all beginners take the "Frame Bungalow" first, followed by the "The Garden House" and "The Gate Lodge" before entering competitions involving a greater knowledge of architectural styles and structure. Indications, properly done, should form one of the greatest elements of a beginner's work, and a knowledge of building materials is necessary at the start if the students are expected to gain a thorough knowledge of the jobs they are trying to draw.

It will be seen from the list of programs that the idea we are trying to apply is to get the students to use their imaginations, to visualize the finished building before a single line is drawn. When ideas have been formed, the students should make a sketch or preliminary drawing of the plan and all elevations. These should finally be brought up to scale $\frac{1}{4}'' = 1'$ and worked over and over until the job is ready for the "finals." The finals consist of the floor plans, four elevations and details, dimensioned and labeled with a neat title block of a practical character. We insist on the plans being completed and handed in on certain dates which are designated when the program is assigned.



STUDENT'S DRAWING. MIAMI, FLA., HIGH SCHOOL.

Rendering is a phase of the work which has been badly neglected in high schools, possibly because the instructors did not feel competent to teach it. Indeed it is a study in itself but can be pursued by the instructor at his odd times until a "style" is developed which is pleasing, and the students can then begin simple renderings in pencil, ink, or colored pencils on transparent sketching paper. Water color rendering requires considerable skill and here is an opportunity to cooperate with the art department. The monotone renderings in Chinese ink have proved the most interesting to us and we believe for beginners that this is the medium to use especially while students are still learning the art of casting shades and shadows. The renderings accompanying this article were done by students during the

first year of the course in rendering and represent the course offered. The conventional column and capital surrounded by washes of various grades is given first with the idea of teaching the methods of laying washes properly and also to teach to the students the casting of simple shades and shadows. The rendering of the window is the second problem offered, and the Doric columns with the antique is third. The fourth problem consists of the entrance with the Ionic columns, and the fifth problem becomes optional with the student, most of them choosing "An Antique" or the "Corinthian column." "The Niche in a Garden Wall" shown is one of the answers to program VI in which the students were allowed to choose their own mediums for rendering.

PROGRAM I

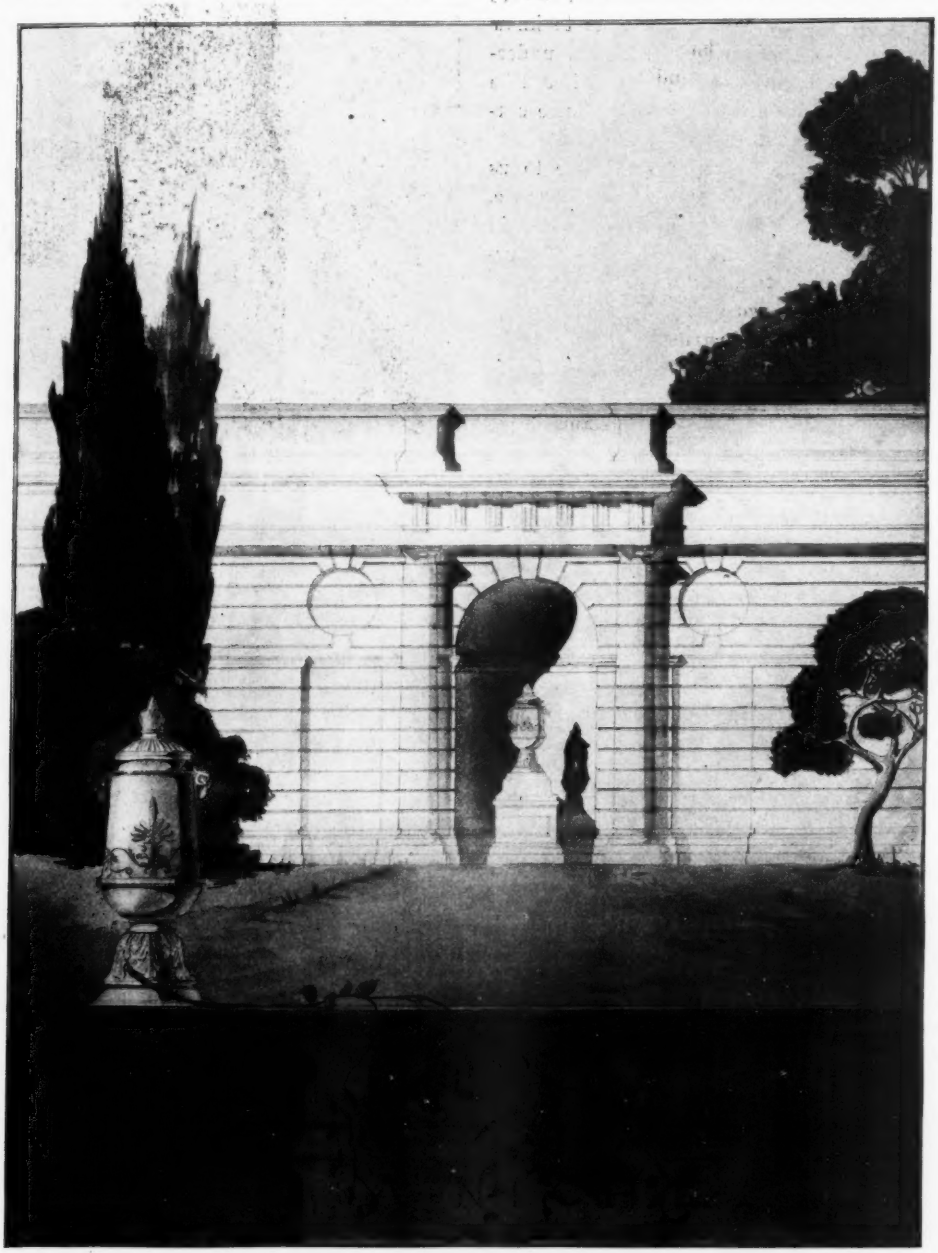
Due January 20th, 1924

A FRAME BUNGALOW

A man having purchased a lot 50x150 feet on the northeast corner of one of our main suburban streets, desires to build a simple frame bungalow for himself and wife.

The lot, which is on high ground, is practically level, has several beautiful trees and shrubs to enhance the beauty and commands a view in all directions. The type of construction of adjoining homes is of the New England cottage and California bungalow type. The designer may use his choice on the type to adopt for this job.

Floor plan not to exceed 1,000 square feet, and price not to exceed $6,000. Plan to include a living-room, two



NICHE IN A GARDEN WALL. STUDENT'S DRAWING, MIAMI, FLA., HIGH SCHOOL.

bedrooms, bath, kitchen, and breakfast alcove or dining-room, also a porch. To be done on tracing or transparent sketching paper in pencil. Size of sheet 14x20, size of border 12x17.

Credit allowed, ⅜ for plans graded 90 or better, ¼ credit if between 80 and 90. If grade falls below 80, plans must be corrected or drawn again to obtain credit.

PROGRAM II

Due February 15th, 1924

A GARDEN HOUSE

Required: Front elevation and plan—scale ¼"=1 foot. Plan can be of any shape except triangular. Tile floor preferred. Elevation—frame construction preferred.

Size of sheet 14"x20", border 12"x17" on sketching paper, rendered in colored pencil. Credit, 1/12.

PROGRAM III

Due March 1st, 1924

A SPANISH ENTRANCE

Required: Front elevation only—scale 1"=1 foot.

Option: Either sketching paper or Strathmore board. To be rendered in colored chalk or pencil. Size of sheet 14"x24". Size of border 12"x17". Approximate cost of residence $30,000. Credit, 1/12.

PROGRAM IV—WORKING DRAWINGS

Due May 1st, 1924

Option—"A Gate Lodge"

A WAYSIDE INN

On a main highway leading to Miami a prominent business man wishes to erect a small inn for the purpose of serving meals and especially catering to dinner and dancing parties. He owns a lot 200x300 feet on a northwest corner of the highway and about eight miles from the city. The lot is well wooded with pines and some ornamental sub-tropical growth. His idea is to have a large dining room which may be used as a dancing room and a large screened porch which may be used for dining or dancing, in connection. The kitchen should be large, well-equipped and have ample storage room. A rest room should be provided for women and one for men, including facilities for checking hats, etc.

Living quarters should be provided for the manager and his family, preferably on the second floor.

The type of architecture is optional; but it should be understood that the design wanted must be of a quality that will insure the success of the inn with people who are appreciative of the best in environment and cuisine.

The cost of construction is not to exceed $75,000.

Required: Plans and elevations, scale ¼"=1 foot. Details to a scale of ¾"=1 foot. A perspective in pencil or colored pencil on Strathmore board. Credit, ⅜ to ½.

PROGRAM IV—WORKING DRAWINGS

Due May 1st, 1924

A GATE LODGE

A wealthy business man from New York City has purchased 20 acres of land along Biscayne Bay and bordering on the Dixie Highway for a distance of 660 feet.

STUDY OF A CLASSIC MONUMENT. STUDENT'S DRAWING, MIAMI HIGH SCHOOL.

STUDY OF THE CORINTHIAN COLUMN. STUDENT'S DRAWING, MIAMI HIGH SCHOOL.

The land has an elevation of 25 feet above sea level, and is covered with a dense growth of live oak, with some pines.

Before building his beautiful home, which will cost $350,000, he has decided to build the gate lodge or residence for the manager of the estate.

The building will be a two-story residence, having a large living room with fireplace, dining room, kitchen, and screened back porch, two bedrooms and bath. Construction should be of masonry and the cost should not exceed $35,000, including the gate.

Any style of architecture may be used and the student should take ample time to study the problem before entering upon the work, being sure that the idea is well in mind to the last detail.

Required: Floor plans and elevations. Details at a scale of ¾" to 1 foot.

Size of sheet 14"x20", size of border 12"x17", on tracing paper. Credit, ⅜.

PROGRAM V

Due February 22nd, 1924

A WELL HEAD

A prominent woman of means has returned from the city to her old home in a quiet village in New England. The church of her childhood still stands on a wooded hill, a simple example of Gothic design.

The woman, desiring to make a gift to the community, choses to embellish the church-yard with a beautiful well head where water may be drawn to freshen the flowers in the chuch-yard. She has selected a site near the old church, using a recessed arch as a background. She prefers a simple but beautiful well head to be erected of stone or other suitable materials.

Required: A front elevation, plan and cross-section—scale 1"=1 foot. Preferred—plan may be square,

round, or octagonal— to be rendered with colored pencil on Strathmore or tracing paper 14″x20″. Border, 12″x17″. Credit, 1/12.

PROGRAM VI

Due April 5th, 1924

A NICHE IN A GARDEN WALL

It is proposed to embellish a masonry wall in the garden of an estate with a niche of ornamental character. This estate, the size and architectural character of which is not given, is located in Miami amid the growth of beautiful sub-tropical foliage. The owner desires a niche which will stand out as the main architectural point of interest in his garden. The character of the masonry wall, its thickness, heighth, color, etc., are not announced, and the cost of construction of the niche is not to be considered.

Required: An esquisse—esquisse, scale ¼″=1 foot, on transparent sketching paper, should be approved by the instructor before the final drawing is attempted. Size of sheet, 8″x11″.

Rendu: Due April 5th, 1924.

A front elevation at a scale of 1″=1 foot. One or more details of the design should be used at a much larger scale to add composition to the drawing. A title should be given. For colored pencil renderings on Strathmore board or transparent paper 1/12 credit will be given. For monotone renderings on Whatmans double elephant, ¼ credit will be given and an extension of two weeks will be allowed.

Plates receiving less than 80% will be rejected for credit.

Size of sheet is optional: 24″x36″, 20″x30″, 14″x20″.

PROGRAM VII—SKETCH PROBLEM

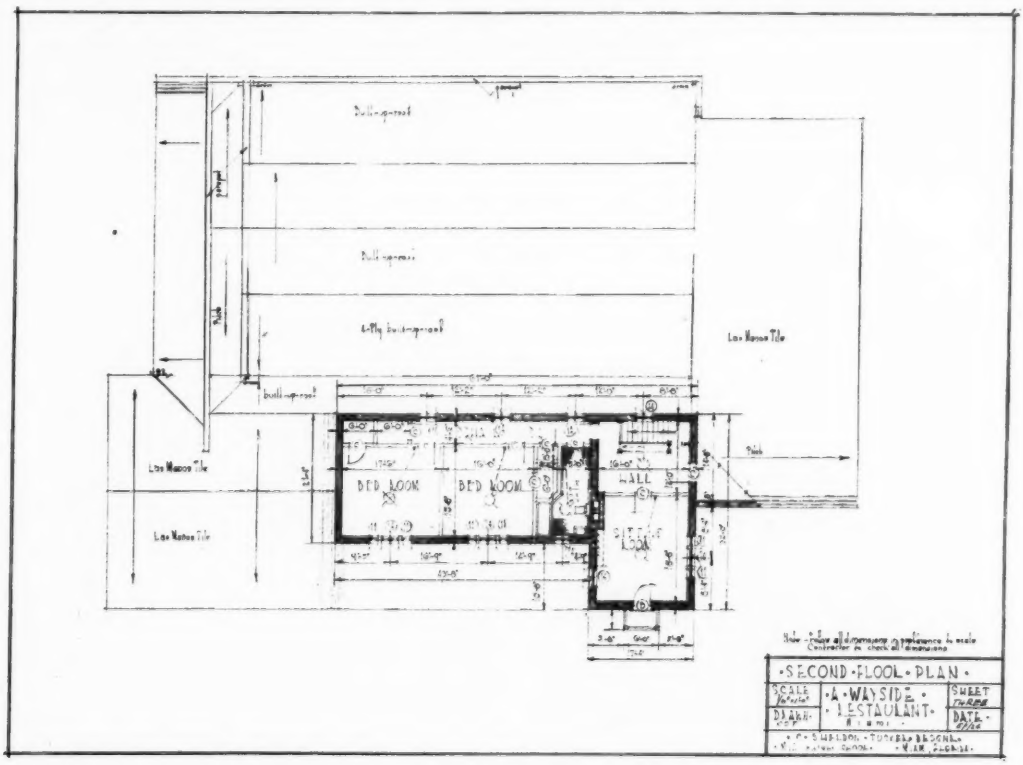
Due May 28th, 1924

A PRIVATE GREENHOUSE

A small estate on the shore of Biscayne Bay is to be enhanced by a greenhouse for the purpose of the propogation of ornamental plants for the estate and for the pleasure of the owner, who, having retired from a strenuous life of business in a northern city wishes to make his hobby one of out-of-door living and plant culture.

The type of architecture of the home is not announced and the style of architecture for the greenhouse

SKETCH PROBLEM, MIAMI HIGH SCHOOL.



TYPICAL PENCIL DRAWING SUBMITTED FOR PROGRAM IV BY STUDENT OF THE MIAMI HIGH SCHOOL.

is optional with the designer. Ten thousand dollars is available for the work, including all equipment, plumbing, etc. The floor space specified is between 1,500 and 2,200 square feet.

Required: A perspective or front elevation and plan of greenhouse and lot, giving location of trees and shrubs. ½ credit.

PROGAM VIII—SKETCH PROBLEM

Due May 28th, 1924

A BUNGALOW COLONY

A prominent business man of Miami has conceived the idea of erecting a colony of bungalows for the purpose of renting to winter residents. His idea is to have between eight and twelve of these bungalows of masonry construction arranged in such a way as to form a community court and give ample ground space for such activities as playgrounds, etc.

The bungalows may be very simple, having a living room, kitchenette, alcove, bedroom or two bedrooms and bath. The cost of each bungalow should not exceed $3,000, or the cost of the group should not exceed $30,000, not including the grounds and a water system.

Size of lot is 200x300 feet and facing on a highway, paved and with sidewalks.

Required: A plan and elevation of the group of bungalows, giving their location on the lot and plan of playground, walks, etc. One-twelfth credit.

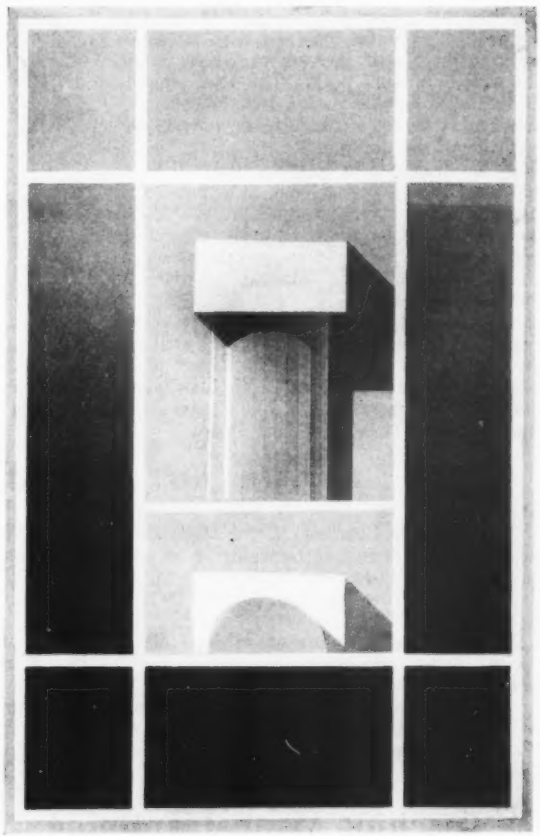
PROGRAM VI—SKETCH PROBLEM

Due May 30th, 1924

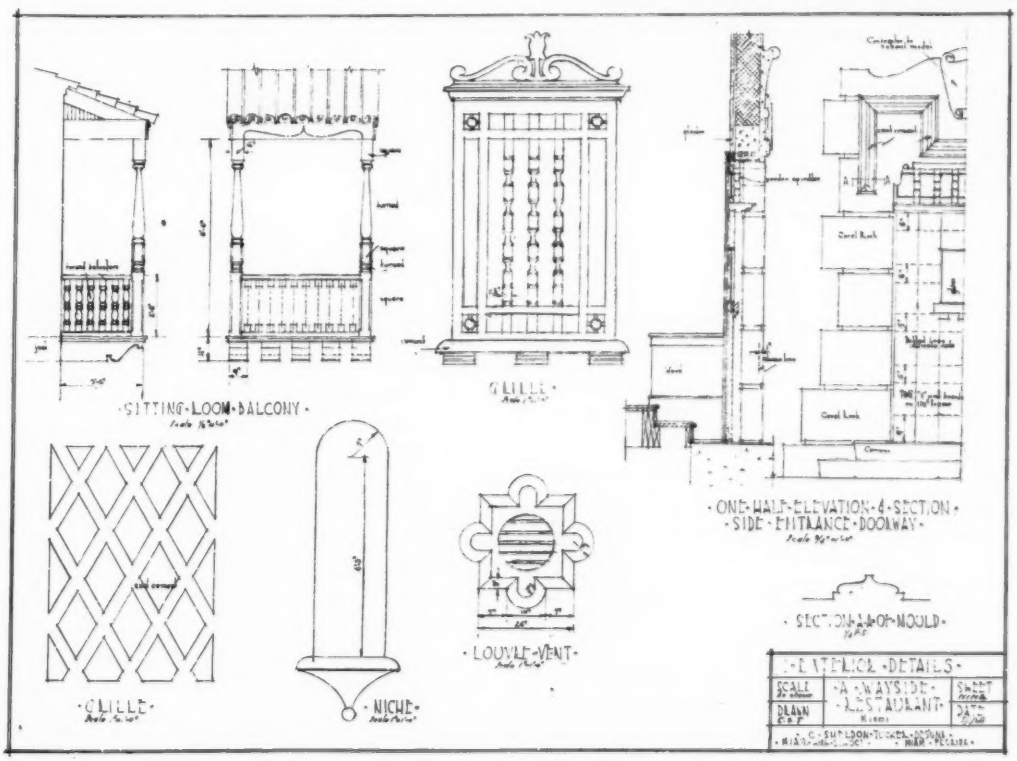
A CLUB HOUSE FOR THE THUMB TACK CLUB OF MIAMI HIGH SCHOOL

The Alumni membership of the Thumb Tack Club, which is composed of many of the country's most eminent architects, wishes to erect a home for members in Miami. The idea of a home for the club has long been in the minds of the members, who, now scattered all over the United States, have resolved to come together at Miami on May 9th, 1924, for the purpose of entering a friendly competition for the design of the club house.

Because of the wealth represented by the membership



STUDENT'S WASH DRAWING, MIAMI HIGH SCHOOL.



DETAIL SHEET OF STUDENT'S PENCIL DRAWINGS FOR PROGRAM IV.

the cost of construction is not to be considered. The building site comprises a lot 100x150 on North Bay Shore Drive facing the new municipal park. The requirements of the building, the rooms, type of construction and style of architecture are left entirely to the designer.

The drawings to be submitted will be in the form of sketch problems, to be handed in not later than May 13th, 1924, at 3:00 P. M. Ten hours will be allowed for the rendering, which will include a plan and front elevation. Size of sheet optional, 20"x30" or 26"x40".

Within 24 hours after judgment of the problems submitted, the winner will be treated at the expense of the losers to an elaborate meal to be given in his honor, consisting of Fragments De Ice Cream Soda and Vignolas Detales of Hot Dogs.

STUDENT'S WASH DRAWING OF AN ANTIQUE.

PROGRAM IV
Due June 6th, 1924
A SENIOR MEMORIAL

The Senior Class of Miami High School, 1924, will no doubt wish to follow the tradition set by former classes in making a gift to the school, a gift which not only will be useful to future students, but will be a thing of beauty as well.

In making a choice of subjects the class will, no doubt, choose wisely the thing which fits the immediate needs of students or of the building.

From an architectural standpoint the project is one of great interest, giving to the designer a wide field for his or her imagination. There are so many interesting features which might be chosen to embellish the present school building or grounds that the subjects submitted should vary greatly.

Preliminary drawings should be submitted by April 1st.

Finals are due May 9th, 1924.

The renderings should consist of an elevation and either a vertical cross-section or plan. Any scale may be used.

The size of drawing must be one of the three following sizes; 24"x36", 20"x30" or 14"x20".

Strathmore board or Whatmans paper may be used, and the rendering may be in either monotone wash or colored pencil. Credit, 1/12 in colored pencil, ¼ in monotone.

Teaching Manual Training by the Factory-Production System[1]

Wallace Grant Higgins.

"The factory-production system will give the student of shop work more experience and better all-around training than any other system of shop organization. Teaching manual training eleven years by this method has convinced me of this fact," said Mr. Burton Knight, supervisor of manual training, Greencastle, Indiana.

What Is the Factory-Production System?

The factory-production system means the output of a standardized article in quantities by the manual training classes. During this process each member does certain prescribed work. Do not confuse this system with the one in which the whole class produces one article. Knight terms this latter a class problem. The difference is that in the first case a quantity of one article is turned out; in the latter case but one article is produced, though the work is apportioned.

Burton Knight's idea of factory-production is like Henry Ford's, save in one particular. Ford's men do one thing all the time. Knight shifts his students around. By thus shifting them he retains the advantages of factory-production, keeps the students interested, and gives the boys greater training.

The Advantages of Such a System

Our civilization is complex; our problem in life is not so much living, as it is living harmoniously together. Corporations owning great research laboratories tell us their problem is to find men who will work in cooperation. The great advantage of this system is that it teaches in school the way of life. Mr. Knight points out to his boys that this is the way work is done in factories. It is the system of life; Bill does one job, John another, and soon the work is finished. Thus, in the seventh and eighth grades as well as in the high school, students learn cooperation. The boys learn that they must work with and for one another.

Greater experience is the next big advantage. By making half the legs for thirty tables, a boy gets greater training than if he had made the legs for one table. Because production under this system is fast, more problems can be presented to and solved by the students than if each boy were working on a different article.

An increased pride in their school is a further result. In the Greencastle high school nine rooms have been equipped by the manual training department. The boys taking part in the building of equipment have a greater pride in their school; it is theirs, they have

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Editor's Note: This paper is of interest to industrial-arts men, not because it describes a new or original method of handling shop classes, but rather because it is a newspaper man's—a layman's—view of an educational achievement. The paper is the result of visits which the author made to the school shops, and the explanations which he received from the teacher in charge. While it discusses no fundamental aims and overlooks the pedagogical principles employed in the class in woodworking, it does indicate how an instructor can vitalize his work and "sell it" to a community by making his methods and his plans understandable, and by showing visitors how the industrial-arts work is related to life situations. In these days of criticism of high cost of industrial-arts, this type of article in local papers would do much in any community to overcome prejudice.

built things for it. During one year the classes under Mr. Knight saved the school board a thousand dollars. The boys are not forced to build things for the school, but elect to do so.

Furthermore, because Bill's work must fit against John's we find the development of a fine sense of workmanship. This may be brought out under other methods, but the friendly competition here tends to hold fine workmanship always in front of the class.

Are There Disadvantages?

No matter what its ultimate position every board must be cut to desired length, squared, and planed to width and thickness. Mr. Knight terms this process, in proper sequence, the conventional method of doing things. Here is a required process for every piece of lumber, a process handled with a certain technique. *Provided this conventional method and its technique are taught first the factory-production system,* in Mr. Knight's opinion, *has no disadvantage.* "But," says he, *"such training must come first, else it is foolish and will result in failure to use the system."*

Reasons for the Failure of the System

Some men have tried this method and have failed. Mr. Knight gives several reasons for their failure.

First, is the failure to instill interest in the student for his work. The teacher does not show the student that he is preparing to do a part of the world's work. He is not made to feel that a fine, square piece of work, done with his hands, is a worth-while accomplishment.

Second, is the failure of the teacher to sense his own problem. Teachers fail here for the same reason they fail in other teaching positions. No study is made to see what the student can best do, or how he can be used to best advantage. The boys then become, like their teachers, square pegs in round holes.

Third, is the failure to understand that the conventional method and its technique must come first. Then the factory-production system can be used for it has a foundation on which to build.

Fourth, in Mr. Knight's opinion too few manual training teachers are practical men; too many of them are theorists, or "book" men. He believes the teacher should be a practical man, able to inspire his students by the fact that *he himself* can *do* things. Mr. Knight worked four years as a carpenter before entering a normal school and starting to teach, and he feels the practical experience gained in the trade not only useful but *necessary* in the classroom.

Five, some teachers do not teach the students to work together. Such persons seem content to have the student fool away three weeks making one simple article. This is bad for the student in that it leads him to think that he is not making progress. And it is likely to make him think all life is that way, continually plodding with no satisfactory goal reached.

How Knight Keeps Students' Interest

Some time ago the commercial department of the Greencastle high school asked the manual training department to build it thirty tables. These were of a special type used in commercial departments. Here was a chance to use factory-production and to correlate with the commercial department. Mr. Knight knew that the boys had heard of the bonus system used in the Greencastle zinc plant. Accordingly, he sent up to the commercial department of the school, and secured some of the paper money used in that department. The boys were told that for each hour they worked one hundred per cent efficient they would receive forty cents in the imitation money of the commercial department. Those two who did the best work were to receive a bonus of five dollars a week. Because the manual training period is a double one of ninety minutes, each boy had a chance to make sixty cents. A time sheet was kept, and if Mr. Knight saw that Bill was working 85 per cent efficient and holding up production, Bill received 51 cents instead of sixty cents. That is, he was paid on the basis of his efficiency.

The commercial department opened a bank which sent advertising matter telling of the bank, its facilities, and its interest rate to the manual training room. The students were paid once a week. Mr. Knight had them carry the money a day or two, just to make the idea seem more real, and then deposit it in the bank.

In twelve periods the thirty tables were completed. Inasmuch as the boys worked two periods at manual training and two at mechanical drawing the work was carried out over a period of six weeks. Results: The school had thirty tables at the cost of the lumber; students in the commercial department had training in banking; and besides being taught to work together and for their school, the manual training boys were taught thrift.

You will note that no real money was used and no money prize was offered. Mr. Knight thinks the use of money shows a weakness in the teacher, and will resolve itself into a situation in which money must be paid if anything is to be done.

* * *

A year or two ago the seventh graders decided to build some bird houses. First, each boy was told the difference between the various kinds of bird houses. He was shown that the cubical contents, the size of opening, the height of the roof, etc., varied. After this each boy designed and built a house. Then the whole class standardized on one type of house and turned out a number of them. After the houses were completed they were numbered and lots were drawn to decide to whom each house belonged. All through this work, Mr. Knight pointed out to his students the points in building a bird house which were similar to those in building a real house.

* * *

Just before last Christmas Mr. Knight asked his seventh graders how many had younger brothers and sisters to whom they wanted to give a toy. Eighteen out of a class of twenty responded. The class talked

over various toys it could make. Finally a little two-wheeled wagon was decided upon. It was to have a red body, black axle and wheels, and a stained tongue and tee. These seventh graders had not seen much of a factory. So he explained to them what a factory was, how it operated, and how people worked together in it. Then he set them to work.

As Mr. Knight walked about the room, when he found a boy who was not working one hundred per cent efficient, one who was holding up production, he would have him fall out and watch the others. Soon he had all the inefficients weeded out. As he dropped each boy he would stop the class and say, "See, boys, this is like real life. Bill here is holding up production, so we have to lay him off."

When he had them all weeded he told each fellow to consider his teacher the owner of a factory, and to apply for a job the same as he would at a real factory.

"Do you want to work in my factory?"

"Yes, sir."

"What can you do?"

"I can make axles, sir."

"All right, you go to work making axles."

In this way the boys were led to the work in which they were most interested. The next day four minutes after class started the first *two* wagons were in the paint shop. And the whole eighteen wagons were completed in *two periods or ninety minutes!* This time includes the first period.

It is by constantly studying his students and showing them that school is like life that Burton Knight succeeds in doing what the dean of the Terre Haute State normal school says is a unique piece of work in his field.

Some Observations on the Cultural Value of Woodworking

Joseph A. Shelley, Jersey City, N. J.

THE products of the woodworking craft have, in some form, been familiar to all men and all lands since the beginnings of recorded civilization. From the cradle period to the end of his days, man is confronted by or in daily contact with, objects wrought of wood. This familiarity has naturally resulted in woodworking taking its place as the most important cultural activity in the vocational field of school work.

Consciously or otherwise these objects of wood have a greater effect upon our cultural existence than any other one physical factor with which we come in contact. The progress of a nation or of an individual on the cultural high road can be accurately determined by the character of the buildings they construct and the furnishings found therein.

Everybody has at some time experienced the thrill and the joy that accompanies the anticipation in and the final possession of a house or a coveted piece of furniture, and the cultural taste of the possessor is fixed by the discrimination displayed in his selections. Taste has been defined as "the power of receiving pleasure from the beauties of nature and art. Only the simplest and plainest designs are relished at first; use and practice extend our pleasure, teach us to appreciate finer design, and by degrees enable us to enter into the intricate and compounded pleasures of art." So an eye for the beauties of the woodworking craft is never all at once acquired. It is gradually formed by becoming conversant with the finer points of the art as exemplified in the works of its best masters.

Woodworking in all its branches is essentially creative. It teaches art through design, and permits the individual to display his information and abilities in a concrete manner. It is a wonderful vocation for developing individuality in the expression of purpose through design and execution. The student may start naturally with simple forms that are in good taste and quite as naturally advance into the realms of higher art.

"The primary ideas of beauty formed by the mind are derived from colors. From the admiration of colors the eye gradually advances to those of form; beginning first with those that are obviously regular, and progressing to those of more complicated form or outline." The natural beauties of the different woods when their surfaces have been prepared for finishing, and the beautiful colors and shades of color that result from the application of the finisher's art, present to the teacher an exceptional opportunity to develop an appreciation of the beauties of colors in themselves, and of their values in contrast with other colors.

On the technical or trade side, it brings out those points of character which are so essential to success. The master wood-worker must possess vision, otherwise he will be unable to think through a given job from its inception to its consummation. The skilful manipulating of keen-edged tools begets confidence, while the operation of swiftly moving high powered machines, arouses a feeling of elation and a sense of power and responsibility.

Manufacturing, too, has its beauties—the beauties of synchronization; the beauty of a smooth flowing stream from lumber pile to shipping department. Dr. Samuel Johnson in one of his essays said, "Among the productions of mechanic art many are of a form so different from that of their first materials, and many consist of parts so numerous and so nicely adapted to each other that it is not possible to view them without amazement. But when we enter the shops of artificers, observe the various tools by which every operation is facilitated, and trace the progress of a manufacture through the different hands that, in succession to each other, contribute to its perfection, we soon discover that every single man has an easy task, and that the extremes.

however remote of natural rudeness and artificial elegance are joined by a regular concatenation of effects, of which every one is introduced by that which precedes it, and equally introduces that which is to follow."

The sources from whence the basic material of the woodworking crafts is obtained are an incentive to the study of history and geography, and a spur to romantic speculation. All of the continents and islands of the earth are tapped; interest in strange people and lands is aroused, a new stimulus is added to the study of their customs, history, and economic and cultural activities.

No material that comes to the hand of any artificer to be directly fashioned into a finished product, is so clean and wholesome as lumber. No material comes so straight from nature, and has suffered so little pollution at the hands of man. The beauty of its grain defies the efforts of the cleverest imitators. Its delightful bouquet is the breath of the forest, and of the clean, wide open spaces of the earth. No thinking can handle a beautiful piece of wood with any but a feeling of reverence, and a realization that it is a magnificent gift from a beneficent Creator.

"Poems are made by fools like me,
But only God can make a tree."
—Joyce Kilmer.

Ivory-Craft for High Schools

Gertrude S. Twitchell.

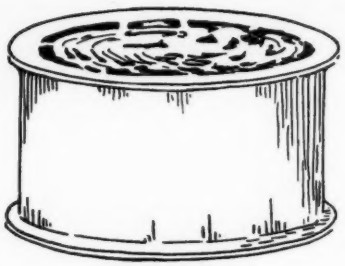
IVORY-CRAFT is a comparatively new form of handwork, but one which is presenting many interesting possibilities for use in both grades and high schools. An article describing problems suitable for grade work was published in the INDUSTRIAL ARTS MAGAZINE for May, 1923, but for those who did not see that number, the following general description will be helpful.

The material used is vegetable ivory, or what has been called celluloid. Various trade names such as ivorene, ivoroid, fiberloid, and others are now in general use. For convenience the term "ivory" will be used in this article. A number of firms carry this material in forms suitable for school use. It may be purchased in sets, or separate pieces, and comes in sheet form in various weights from paper thickness to an eighth of an inch thick; in bar form, and in rods and tubes of different sizes and shapes. Most of these come in a variety of colors, ranging from the white ivory through all shades of color to black, and including tortoise shell, jade, and other interesting variegations in mottled and mixed tones. Cement to be used in the work is included with the sets, or may be purchased separately at artists' supply stores. Even the five-and-ten cent stores usually carry a transparent "china and household" cement which is satisfactory, if used with care. The material for this new craft is inexpensive and easy to work with, and the equipment needed, while, of course, depending upon the type of articles being made, is not at any time very large.

In cases where the design and applied art, or crafts, departments are not under the same instructor, an opportunity is offered to prove the value of correlation and cooperation, which is not always as carefully worked out as it might be. If the materials for the actual work are taken to the design room at the beginning of a problem, a definite basis upon which to proceed is at hand. The student then has before him the colors and materials that present certain limitations, or possibilities, which must be taken into consideration when planning

HANDBAGS WITH IVORY TOPS.

the design. This eliminates the chance of taking the finished design to the applied-art room, and there discovering that the design as originally planned cannot be worked out in that particular way on account of limitation of that special material. Valuable time is often wasted in changing over a design to make it available. When designs are planned with materials at hand, it is easier to visualize the finished product, and this tends to bring out a better sense of the connection between design and finished article, and also brings the design room and the workshop into closer and more harmonious relationship.



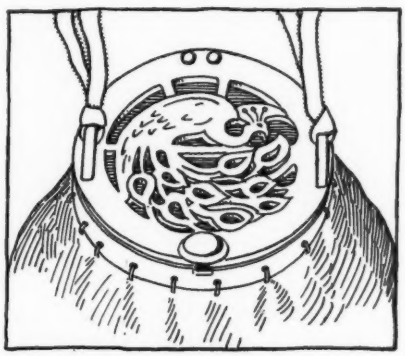
BOX OF IVORY.

We shall suppose that we have already worked out our designs, and now turn attention to the tools and other equipment. For problems similar to the bag-tops and comb shown in the accompanying illustrations, the following will be needed: A sawing-board, known to jewelers as a bench-pin; a small clamp to hold the sawing-board to the bench or table; a hand-drill with small drills; a small saw-frame and saw blades to fit; several assorted small files; fine and very fine sandpaper; engraving tools in V and U shape are best, but when not available a sharp knife may be used to add the carved lines.

Regular bench-pins may be purchased, but the sawing-boards may be easily made. Take a board three-eighths or a half inch in thickness, about three inches wide and ten or twelve inches long. A V-shaped notch an inch or an inch and a half at the opening, and extending back about two inches, is cut in one end of the board. Sandpaper the board smooth. Clamp the board firmly to the work bench, having the notched end extend perhaps six inches beyond the front edge. Material to be sawed is held in place on this board with the left hand, having the space that is being sawed out kept directly over the notched opening. The saw-frame is held with the right hand, keeping the saw-blade perpendicular all the time, and working up and down with a steady movement, and with a very slight forward and downward pressure. It is important that the saw-frame be kept perpendicular unless a constant renewal of blades is wanted.

DESIGN FOR BAG TOP OR BOX COVER.

The saw-frame itself may be the small variety used in toy-making, but regular jewelers' saw-frames with saw blades Nos. 2 and 3 are to be preferred. The pupils should be taught first to put the blades properly in the frames, as this is most important to progress. Always fasten the top of the blade in the slot at the upper end of the frame first, teeth pointing downward, turning the thumbscrew tightly. Adjust the back of the frame so the blade will extend just to the upper end of the lower slot. Again be sure the thumbscrew is secure. Hold the frame with the top bar against the bench and spring it, using the left hand, so the blade will extend into the lower slot as far as possible, using the right hand



THE BAG TOP.

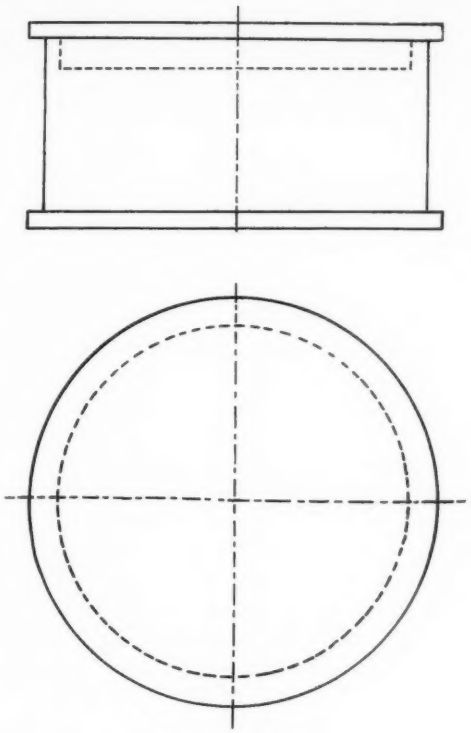
to guide the blade and fasten the screw which will hold it. The blade will be pulled taut when the pressure on the frame is withdrawn, and this will prevent its bending and breaking too easily when in use.

The files necessary for finishing are called needle files. Several assorted flat and half-round ones in fine and medium cut will be convenient.

Do not have any open flame or fire in the work-room while using this material. Keep the waste scraps in a covered metal box so that the janitor may dispose of them properly. They flare up very quickly when brought into contact with fire.

The comb shown in the illustration is perhaps the easiest problem and it would be well to start with either this or a similar design. Tortoise shell or amber color will be most generally useful, but for a fancy party comb, one could use ivory, or some color to match a particular gown. This question must be carefully considered, as a bright color used in a comb at once limits its usefulness. If one has a favorite new party gown, it might be worth while to make a comb and also a bag-top to match, as it will be noticed that the comb design is an adaptation of the one on the larger bag.

Having planned the color to be used, a very careful pencil tracing of the design is necessary. This tracing should be glued or pasted to a rectangle of the material of a proper thickness for a comb. Let the tracing dry before going on with the work. Do not stretch the



DETAILS OF BOX.

tracing when pasting it to the material or the design will be lop-sided! Find a drill that will not be too large to use in the smallest spaces, and drill one hole in each opening in the pattern. Unfasten the saw blade from the lower slot, insert the end of the blade through a drill hole and slide the piece of material toward the top of the frame. Spring the frame as described in the first of the article, and fasten the lower thumbscrew securely. The sawing may now begin. Work slowly, as the material cuts easily. Care must be taken to keep inside the pencil lines, or when the tracing is removed it may be found that the saw has cut into those parts of the design which should be left whole. It is better to true up all openings with the files after sawing, rather than to saw so closely that one cuts beyond the outlines. Any unevenness in the openings will, of course, show most plainly in the finished work, as it changes the design noticeably.

Leave the sawing of the outside outline and the teeth until after cutting the openings in the design. Use a straight-edge of some kind and scratch through the tracing of the teeth, using a metal point of some kind. Remove the tracing paper and carefully true up these straight lines again before beginning to saw. It is difficult to saw the teeth through the paper and keep them straight and even.

Use the small files to carefully true up all the openings, rounding all edges slightly. The outer edges may be rounded with either files or sandpaper. Round the edges of the teeth also, and file the ends to a smooth and somewhat pointed shape, so they will not pull when putting the comb in place in the hair.

The veins, or carving, in the design should be made with an engraving tool; but if this is not available, they may be marked out carefully with a sharp knife to simulate engraving.

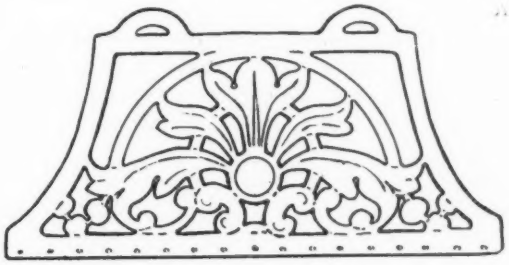
Finish the outer edges with very fine sandpaper and finally rub briskly with a woolen cloth. If there are many scratches on the work, it will have to be dipped in acid. This will give it a polish all over, as well as take out any slight surface scratches. Deep scratches, however, must be sandpapered out first.

Glacial acetic acid is used for polishing and may be purchased from any drug store. Pour into a shallow glass or poreclain dish enough acid to cover the comb. Dip quickly by means of threads or fine wires tied to the comb, or use small tweezers, and see that the comb is entirely immersed for a few seconds. Remove from the dish at once and hang up to dry. Take off any drops which may collect on the ends and in the openings, using a piece of blotter or a corner of old cloth. It is best to use rubber gloves when handling the acid, to prevent roughening of the fingers. If any gets on the flesh, wash it off at once. The acid must be kept in a moderately warm room, as it crystallizes in a cold atmosphere. If this happens, it must be left in a warm room until liquefied again.

The acid dip finishes the comb, which will be ready to handle in a few hours when the surface has hardened. If care has been used in working and sandpapering, it may not be necessary to use the acid.

The comb, being dried thoroughly, is ready for the slight curving which will make it fit the head. Have two dishes of water, one as hot as the hands can stand, and the other cold. Remove the dish of hot water from the fire before using. Place the comb in the hot water for a few moments until it can be bent a little with the fingers. Hold it tightly, bend it gently, and then plunge into the cold water. This will harden it at once. Repeat this heating, bending, and stiffening until the comb is nicely curved. Several heavy rubber bands or some fine wire, placed around it after the bending is begun, may simplify matters if the fingers cannot hold it securely enough in the curved position.

The round bag-top was made from a commercial bag. Similar ones may be found in almost any department store. Before working, it will be necessary to



DESIGN FOR BAG COVER.

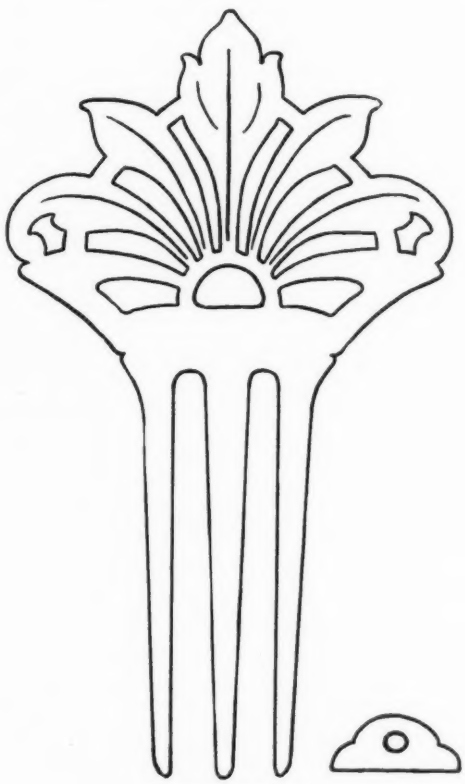
COMB.

remove the top by taking out the tiny screws from the hinges. (It would be wise to seal the little screws up in a marked envelope if one wishes to use them later.) If the cover has a mirror on the back, this must be removed. Run the tip of a thin-bladed sharp knife around the bottom of the moulding which encloses the mirror and carefully remove it, so it may be replaced later. With equal care saw or cut off the piece in the center of the top, through which the handle is supposed to go. File and sandpaper the top smooth after this has been removed. The design may now be sawed out and finished by filing and sanding all edges of openings. Handles must now be provided to replace the center one which was removed. Cut two pieces of stock about an eighth of an inch thick, and shape them like the pattern given. Use a large drill to bore the holes for the handle. These two pieces must be cemented to the top at each side like the top in the illustration. After the cement is thoroughly dry, give the cover the acid finish as directed above.

If desired, a colored insert may be placed back of the design in order to bring out the pattern. The one in the illustration had a delicate blue-green variegated tone which suggested a garden. If one has thin material of the desired color, this can be used. If one cannot find just the right color, cut out a round of thin white, and color it delicately with thin oil colors, dyes, indelible water-colors, or colored inks used in thin washes. By mixing denatured alcohol with the color, it will sink into the ivory a little and when dry will have a glaze like the outside. Place this color insert back of the openings in the cover, hold the mirror in place, and then cement the moulding back around the mirror as it was in the first place. If the moulding was carefully removed and the edges smoothed, there will be little difficulty in replacing it. If the acid changed the tone of the top slightly, the other half of the top (that is, the big ring part), will have to be dipped also. Replace the tiny screws in the hinges and the top is ready to be mounted on any material one wishes. Black velvet with a soft shell pink crepe lining was used for the original. Avoid a fancy material with a design, as the cover already is design enough in itself.

If one cannot find the ready-made top, the panels may be cut out of flat eight-inch stock, tiny holes drilled at intervals close to the edge, and the panels mounted as shown in the sketch. This bag is simply made, using a straight strip of silk or other material, gathered where it is attached to the panels, and a place left open at the top and hemmed. This opening is cut in the center of the gathered material after it has been sewed to the panels. A little study of the sketch will indicate how this is done. A lining should be added, and also strap handles about an inch wide. A snap fastener, at the points where the handles are attached to the inside of the bag, holds the bag together satisfactorily.

The question of lining and outside color, and whether or not to insert a different color back of the



DETAILS OF COMB.

pierced design, offers an interesting angle of this problem, and the mounting of the tops brings the work into correlation with the costume design or dressmaking department.

The other design is a little more complicated and would make a fine exhibition piece when made up. Two sides are needed, and the work must be very carefully done or the delicacy of the design will be lost in clumsy workmanship. The tops are mounted on velvet or other material by means of sewing through the tiny drilled holes in lower edges of the panels. Fancy braid or beading of some sort covers the holes and the edge of the lining in the inside, and beads do a like duty as well as add interest to the outside edge where the stitches are to be covered. The illustration is clear enough so that one does not need detailed directions for making the bag part. Indeed, this leaves an interesting problem in color, shape, proportion, etc., to be worked out. Ivory material was used for all the original tops but other colors may be used if preferred, again giving consideration to the question as to whether one is limiting the general usefulness of the bag in so doing.

These designs may be adapted to other uses, one of which is suggested in the sketch of the round box which would make a beautiful jewel-case if lined with velvet harmonizing with the color insert placed back of the open design. Study of the drawing will show how the box is made, and this will bring out also a problem in simple mechanical drawing and illustrate its usefulness in every-day work. One-eighth inch material is used for the top and bottom of the box which extend beyond the body. Material thin enough to roll when softened in hot water is used for the sides. Shape the sides, or body, about a bottle or some other perfectly round object, cement the seam carefully and dry it thoroughly before cementing the body to the bottom. After the cover design is finished, cut a collar, or flange, of thin material and cement it to the under side of the top to hold the cover in place. Make this just small enough to slip inside the box and fit easily.

From the suggestions here given, the alert supervisor or teacher will be able to get many ideas which ought to prove of interest. Different designs may be made to be used in the same way as these have been, or these designs may be adapted for use on various other articles.

Industrial-Arts Sketching

Carl L. Svensen.

(Part V—Concluded)

THE ability to make freehand pictorial views is an accomplishment that can be used to advantage for many purposes. When skill has been attained, pictorial views can be modified by giving them a perspective effect to render them more pleasing where parallelism of the lines is objectionable. Foreshortening of the distances on one or two axes and varying the angles which the axes make with the horizontal are ways of improving the appearance of the sketch.

For sketching purposes it is often desirable to imagine that the object is in a rectangular box which will just contain it. This will locate the object, give directions of the lines and show the space required. Such a

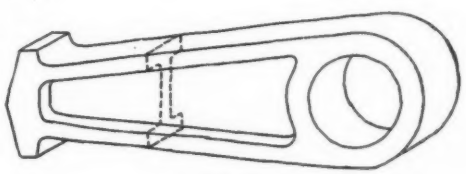


FIG. 18.

method is especially necessary when cylinders and irregular shapes are to be sketched. Circles are drawn by locating the pictorial squares which contain them and the curves and ellipses drawn to correspond with the circles as they would appear on the face of a pictorial cube. For arcs, sketch radii from tangent points to locate the centers for the pictorial arcs.

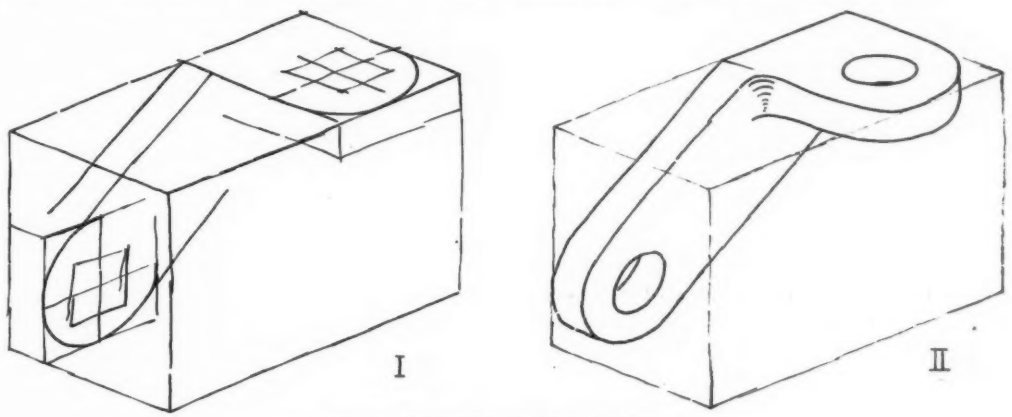


FIG. 16. CONSTRUCTION FOR CURVES.

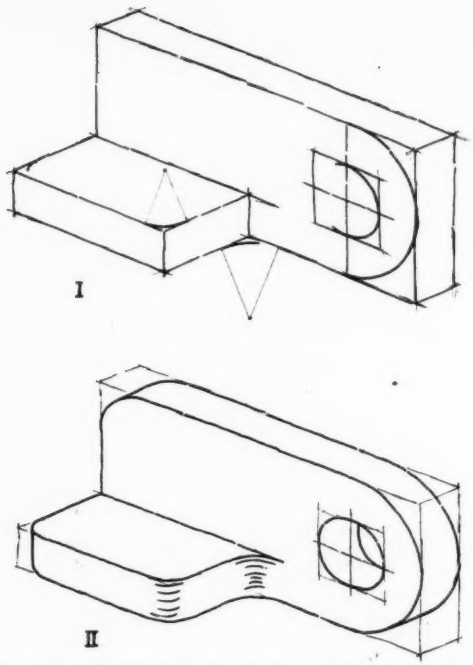


FIG. 17. CONSTRUCTION OF ISOMETRIC STYLE SKETCH.

At I, Fig. 16, the "blocking in" lines for an isometric style sketch are shown with the centers for some of the arcs located. The piece is considered as made up of two rectangular pieces. Compare the finished

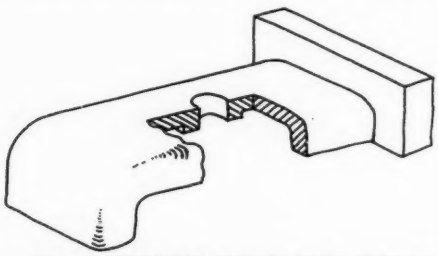


FIG. 19. ISOMETRIC SKETCH WITH "BREAK."

sketch shown at II, Fig. 16, and note the freehand treatment of filleted and rounded corners.

At I, Fig. 17, the box which will just contain an irregular object has been sketched and some of the lines

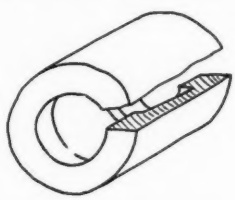


FIG. 20.

and centers located. Note that the axes make a small angle with the horizontal, and that the piece is "blocked in" as though made up of pieces having sharp corners. The finished sketch with the "box" indicated is shown at II, Fig. 17.

In most cases, isometric or similar style sketches should be used for objects having circles or curves in

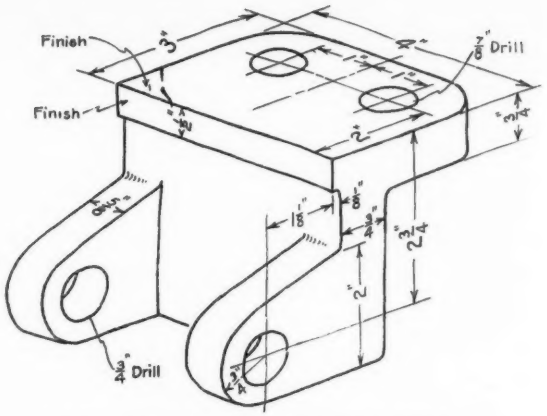


FIG. 21. DIMENSIONING A PICTORIAL SKETCH.

more than one plane and for objects having more or less "box-like" form or with incidental parts such as lugs, brackets, etc. It should be noted that concentric

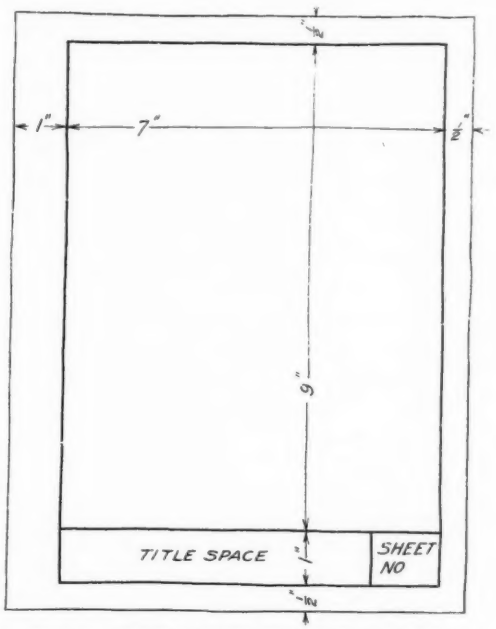


FIG. 22. SHEET LAYOUT FOR 8½ X 11 PAPER.

circles appearing on the top face, when represented in isometric, are ellipses with a greater distance between them on the major axis than on the minor axis.

Where most of the curves, circles, arcs or irregular

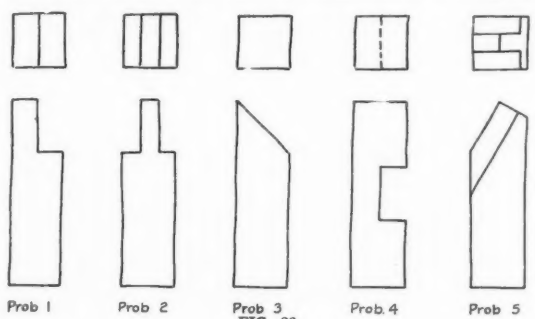


FIG. 23.

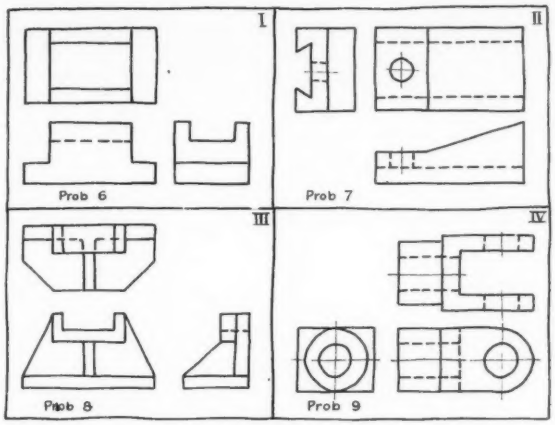


FIG. 24.

shapes are in parallel planes, the object can generally be well represented in oblique as the curves then appear in their true shape, Fig. 18.

Construction lines should be blocked in very lightly for all parts of the object as though working with in-

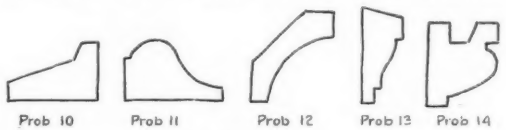


FIG. 25.

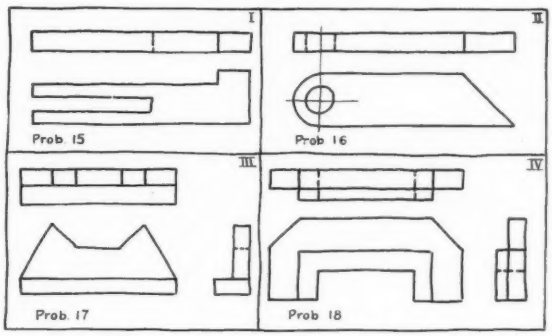


FIG. 26.

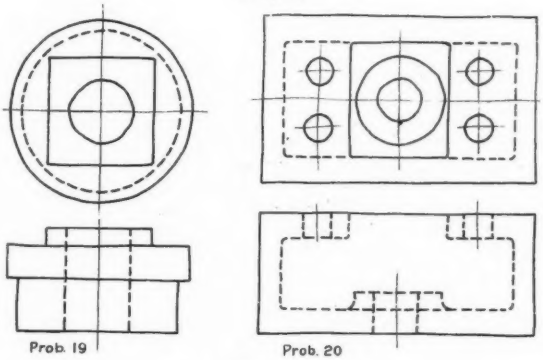


FIG. 27.

struments so as to be sure of getting the correct proportions and locations. It is possible to take many liberties with a freehand pictorial sketch, such as breaking away a portion in order to show what is behind it, Fig.

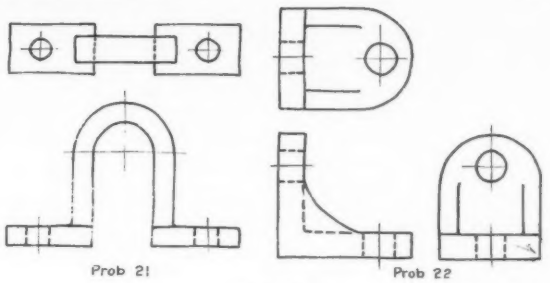


FIG. 28.

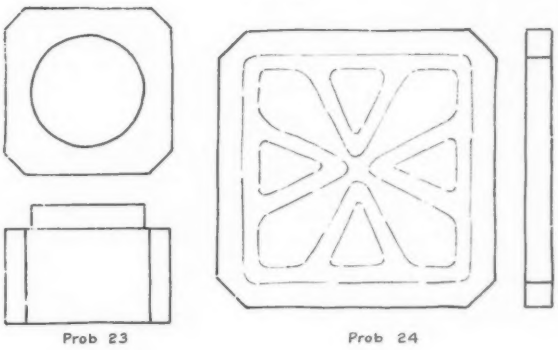


FIG. 29.

19, or to show the interior of a hollow piece, Fig. 20. Lugs and attached parts can be shown separately by pictorial or orthographic views. Notes are frequently valuable. Dotted lines are not often shown on pictorial sketches but may be used to a limited extent when they serve to make a detail or section clear or save an extra view.

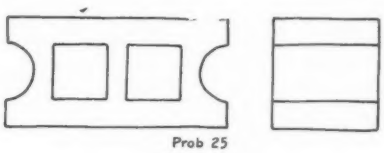


FIG. 30.

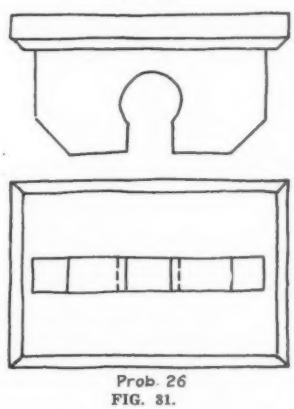


FIG. 31.

When a pictorial sketch is used as a working drawing or in place of orthographic views, dimensions must be added and finished surfaces indicated, Fig. 21. The finished surfaces are indicated by a note and line terminating in an arrow and touching the surface. Dimen-

sion lines are drawn parallel to the axes or in the pictorial planes, as illustrated.

Sketching Problems

The problems suggested may be conveniently worked on 8½" x 11" plain paper, either white or cream. A border line and title space are desirable and may be drawn with instruments or freehand, Fig. 22. If freehand, estimate the distances which are indicated on the layout.

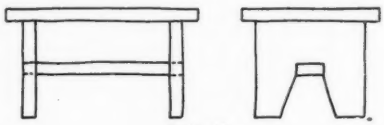


FIG. 32.

The orthographic views are sketched in proportion. These proportions should be kept when making the pictorial sketches. In each case sketch in the axes and estimate the approximate space needed for the complete view.

Probs. 1, 2, 3, 4, and 5, Fig. 23. Make an isometric sketch for each of the *wood joints* shown.

Probs. 6, 7, 8, and 9, Fig. 24. Make isometric sketches of the *support, slider wedge, stand and knuckle.*

Probs. 10, 11, 12, 13, and 14, Fig. 25. Make an oblique sketch of each piece of *moulding.* The end views are shown. Use any desired length.

Probs. 15, 16, 17, and 18, Fig. 26. Make an oblique sketch of the *latch, link, support, and half frame.*

Probs. 19 and 20, Fig. 27. Make pictorial sketches showing the *plug cap* and *hanging box* in section.

Probs. 21 to 28. Make pictorial sketches for the problems which follow. Use the method which will show the shapes to the best advantage.

Prob. 21. *Wrought iron eye.*
Prob. 22. *Corner piece.*
Prob. 23. *Ink well.*
Prob. 24. *Tea tile.*
Prob. 25. *Concrete building block.*
Prob. 26. *Broom holder.*
Prob. 27. *Foot stool.*
Prob. 28. *Kitchen table.*

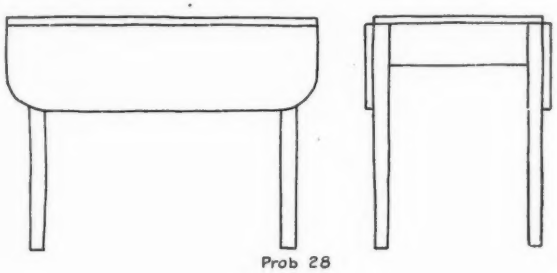


FIG. 33.

School Printshop Practice

W. W. White, Waterloo, Ia.

MANY articles appear regarding the values and advantages of teaching printing in the schools, all of which have much good thought and have brought the subject into favor all over the land. At this time some every-day shop kinks might not come amiss along this line.

Printing is now in the stage woodwork found itself some score of years ago. Then the practice joint and the set problem was considered the only thing educational in woodwork, while today very few instructors hold to this plan. But in printing most instructors adhere to the formal exercise plan of teaching, the common view being that, where the work is all practical, real, needed work, the educational feature is lacking and the only gain is a saving for the school in printing bills.

Under some conditions this, no doubt, is true; but we believe it possible to so conduct a shop that all work, except possibly two or three exercises, may be of a practical nature, real jobs, for which the boys may be held responsible. We admit that such a plan makes for a vast deal more work for the teacher since the task of handing out regular and uniform jobs is an easy one compared to the labor of getting a variety of typical problems in their natural sequence, all needed by the school or community. And where these jobs come in most ideally, the matter still does not fall as a carefully graded course of exercises might. However, the advantage gained by a greater interest and motivation is to be preferred to the dull routine of the setting up and taking down series of set problems.

It is not difficult to find work of every nature a school shop could care for. The school paper offers exercises in straight matter required for the beginning classes, and the cover and headings afford the desired practice for advanced pupils in display composition, design, two and three-color work, embossing, etc. Courses of study and reports also furnish similar exercises.

The school directory is somewhat advanced and offers new problems as it often contains financial reports, courses of study, etc. Then there are tickets, posters, report and record cards, blank forms of all kinds, which provide exercises in tabulation, programs, letterheads, envelopes, tags, outlines and tests for all subjects in the grades.

Work outside the school need cause no trouble if rightly handled. Printing for clubs, Red Cross, the boy scouts, and other organizations takes on the aspect of charity work, since the cost of materials should be the only charge, and it would be a narrow, grasping local printer who would complain of such work done by the school. Many times these jobs could never be done at all unless the cost to the organization is as low as the cost of material. Ocassionally a job may be taken from a business man, when other sources fail to provide the variety wanted. Printers, there are, who will send work to the school shop, too small for them to bother with, yet offering the school a fine exercise. We have in mind such jobs as check reprints, a hundred billheads, calling cards, and the like.

Every six weeks we rotate the jobs of pressman, impositor, binder, proofreader, etc. This provides ample time to become familiar with the different kinds of work in a printing establishment. This amount of time does not allow for any degree of skill; but, as our aims are prevocational in nature, we feel this is sufficient. However, many of our boys secure positions in the printshops of the city.

Some of the kinks we have used are invaluable aids in running a shop like ours, and without some such arrangements the work would truly be chaos.

When the dummy of the school paper (Fig. 1) is made up and paged and the copy arrives, we have a rubber stamp (Fig 2) which we use on the copy itself and in the dummy. In the circle is placed the number of the copy and when the job is issued the name of the boy setting the composition is placed on the line, both on copy and in dummy. When the job is set and assembled, the boy takes a proof, pins this proof to the copy, and places both in a rack we have made (Fig. 3), marked *"for correction."*

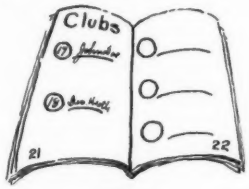


FIG. 1.

FIG. 2.

The proofreader takes these from the rack and after carefully marking them, returns them to the rack marked *"corrected proof."* This is repeated until the composition is correct, when the proofreader makes a check in the dummy beside the corresponding number to indicate the type form is ready and places the proof and copy in rack marked *"for imposition."*

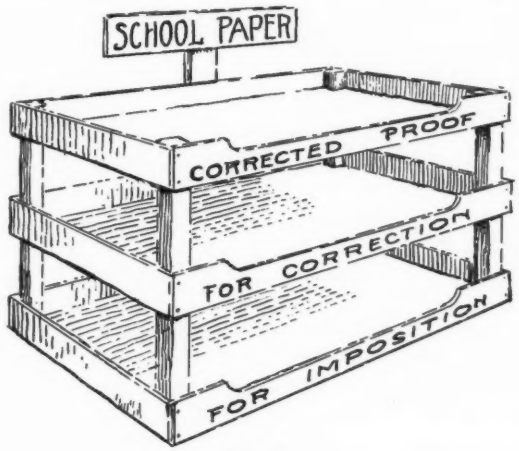


FIG. 3.

On looking through the dummy, the impositor or instructor can tell exactly what material is ready or if there may be some delayed. The impositor can tell just where the different compositions should go from the number on the copy and in the dummy, and he knows just where to find the type, from a table giving the names of all compositors and the corresponding numbers of their galley rack, which is also the same as the number of the type case at which they work.

When the impositor has arranged the type into page form, he takes a proof of these pages, and this, together with the copy, is sent to the author for final correction, while the preliminary proofs are returned to the instructor for grading and further reference. Proofreaders and impositors place their initials on all proofs marked or page proofs taken. In this way all errors may be traced, whether they be in composition, correction, justification, or imposition.

A similar mark is used for all job work, except that here a square is used instead of a circle and the proofs are placed in a different rack marked *"job work,"* and instead of a dummy a free list on a large card, or notebook, is kept. Here again, when the proofreader finds them correct, he checks them so that the lockup man may know what is ready, and the stockman and pressman prepare for it. A regular job envelope is used, containing the usual information; for whom the job is done, quantity wanted, kind of stock, charged to whom, etc.

When two or three publications are running along together, other shapes are used for the numbers to prevent confusion.

We do most every kind of work done in commercial shops, and though the time spent on a job is a factor in grading, we do not attempt the hurry jobs so that those who have printing done by us must plan ahead or have their printing done elsewhere.

Academic work for the three semesters includes the usual material such as history of printing, proof marks, engraving, stock figuring, paper making, etc. This work occupies about two of the twenty weeks in each semester.

All wastage of stock and other material, as well as breakage of machinery, is charged to the boy responsible. Many other shop kinks and appliances are in use to make of the school shop a place of order and system. Those set forth seem to the writer to be among the most important.

YOUR SHOP

William L. Hunter

Within the shop one often finds
Of those who work upon the benches
A person here or there who fails
To leave in shape the things he uses.

This may not be an awful crime
But, friends, it takes a lot of time
To go 'round after work is done
And clean up for the careless one.

Yes, you who read may not be guilty
Of leaving tools and benches dirty,
I know you always do your best,—
The other fellow is the pest.

Now, really, don't you think it true?
If you kept shop you'd know it too,
A bench that's good enough to use
A cleaning you should not refuse.

I may keep watch as best I can
To see that things are neat and clean
But you must help at quitting time,
The shop is yours as much as mine.

BRUCE-MILWAUKEE

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

HOUSEHOLD MECHANICS

When the trend began to swing away from the old formal manual training and the cry became insistent for real, practical problems and interesting work, but few teachers of the industrial arts really dreamed of the radical departure which the work would take from the stereotyped form of shop work.

Now, however, a well-organized course in Household Mechanics may be found in almost any good system of schools. It was once beneath the dignity of the shop class to bring the old rocking chair from home for a new rocker or for some other repairs. Now, the pupils not only bring the old rocker, but they bring the locks, hinges, the toaster, the dish pan, the vacuum cleaner, the phonograph, and the radio. All this work is organized by a skilful teacher into an effective means of teaching the pupils the principles of the construction, the care, and the repair of the various mechanical devices and conveniences found in the modern home.

It took a good while for such work to acquire standing in the school shop. Both teachers and pupils had for so long been brought up on the idea that there were essential sequences in both tools and tool processes, that such things as household problems seemed to them entirely too haphazard. By this time, however, the industrial-arts teachers have become rather well adjusted to the fact that neither tools nor structural processes must be used in unvarying sequences.

The Household Mechanics work was happily saved from some of its early enthusiastic friends who wanted to place it in the hands of school janitors, carpenters, and electricians as they went about doing the repair work of the schools. Wiser leaders saw that if it was to succeed, the Household Mechanics work would have to be organized and conducted by a *teacher* trained both in mechanics and in teaching. This now seems the universal method.

There has been no more vital and helpful movement come into the field of industrial-arts than the movement for real problems that meet real needs such as are found in the Household Mechanics courses now in use in some of our best schools. Teachers who are not doing any of such work and perhaps who are out of sympathy with such courses should investigate what is being done along this line in such cities as Detroit, Cleveland, and elsewhere. The work can be introduced into any shop or system in any city or town of any size.

INDUSTRIAL EXHIBITS AND MUSEUMS

Considerable emphasis has been placed recently by several western cities on what they choose to call "industrial art." Centrally located rooms or buildings have been provided for exhibition purposes. To such places, manufacturers, distributors, and merchants bring samples of the products of the various industries, especially of the local community, and put them on display. A kind of current museum has therefore been established. Courses of lectures and studies have been offered. A genuine attempt has been made to disseminate interesting and important matters of information, to the end that the local community may know what is being produced in it; the quality and design of its products; and how those products compare with the products of other places and times.

The natural reaction of such a movement is to make the manufacturers, distributors, and merchants better informed concerning the production and merits of their own goods and to make them more and more eager for improvement.

There is nothing particularly new in such enterprises, but they represent a perfectly serious attempt to foster the establishment of real, permanent institutions which will wield almost immeasurable influences. They are to be essentially *educational* institutions. They will influence not only the problems and products of industry, but they will influence the *very* life and thinking of the people in the communities in which they are located. They should be encouraged in every possible way, for they will become great educational agencies in cooperation with the public schools.

ANOTHER TASK FOR INDUSTRIAL EDUCATION

It is a difficult matter to evaluate the various school subjects and to assign each one to its particular place in education and in life, and to tabulate the precise contribution that each makes. Moreover, it is an undetermined question as to just how far inheritance and native endowment go in the achievement of success or worthwhile life.

Certain it is that no effort should be spared and no means neglected that would bring the children of this generation to a realization of the importance and value of *truth* and the extreme necessity for strict adherence to truth in all of its relations to life and thought. Sometimes it seems a bit discouraging to note an apparent disregard for truth among many young people. Capricious fancy or imagination of childhood often seems to have been pushed forward into the more mature years.

Explanations of various sorts are forthcoming from every quarter. The prevailing epidemic of unreality and distortion in the present day movies seems a most

plausible explanation. But whatever the explanation, the seriousness of the tendency is not to be doubted. Effective remedies are needed.

In spite of the fact that this situation has become more noticable, if not more serious, during the rapid development of industrial education, we are still strongly of the opinion that such work in the schools will tend to *call young people back to truth.* Industrial work in the schools deals with reality, with facts and truths in their relations. It deals with them in simple and perfectly obvious ways. The penalty of error and falsity is likewise obvious and immediate. In such work, the pupil soon learns that the false, the erroneous, and the deceptive *never pay.* The person who deals in falsehood *thinks it pays.*

No greater lesson can ever be learned or taught than that, in the long run, error, untruth, and deception can never win over right, truth, and justice; that disregard for truth is cowardice; and that dishonesty and deception are always weak allies in unworthy causes.

Here is a place where industrial work in the schools can rise above all other work and contribute a vital element to the character and conduct of each individual. Every teacher of such work should feel that in addition to the experiences, information, and skill which his work furnishes, it should also cultivate in the highest degree the *habit of regard for and obedience to the truth.*

WHITE COLLARS AND SOILED OVERALLS

With the advent of the vocational school came not only a new order of things in the industrial life of the nation in that education took a hand in recruiting the army of skilled labor, but it did something more. It dignified labor and made for a higher sense of honor between employer and employee.

The old-time apprentice, no doubt, respected the soiled overalls of the journeyman-worker and was infused with a certain pride in a trade calling. The employer or foreman who served as the instructor may have been courteous and helpful, or he may have been rough and contrary; he may have been a kindly leader or a cruel driver.

At any rate, there was something in his attitude that placed the apprentice under the momentum of compulsion. The apprentice was under the authority of the parent on the one hand and the shop foreman on the other. The apprentice moved under pressure rather than under a free volition. He must become a mechanic because his father was one. The pride of a calling may, or may not, have been stimulated.

The atmosphere of the modern trade school is something wholly different. The approach even of the student to a chosen calling differs from that of the old-time apprentice. His approach is voluntary rather than compulsory. He has, as a rule, a greater option to train for a white collar job or to don soiled overalls. Individual inclination and judgment, rather than a parental command determine his course.

The precepts of the modern vocational instructor, who is intellectually a higher type than was the old-time factory foreman, not only instil the value of accuracy but also stimulate a more intelligent grasp of the ethics that must obtain between employer and employee.

Much could be said under the heading of the white collar job versus the shop overall. But, all resolves itself into a proper division of the workers of the land into distributors and producers. The farm and the factory precede the clerk and the accountant. Things must be produced before they can be sold and consumed. And in the nature of things, the distributors cannot outnumber the producers.

The young man who is debating the choice of a calling in the light of opportunity and economic advantage should not overlook the fact that success has been won in the field of industry with greater frequency than it has in the white collar field. Let no student delude himself into the thought that he must enter the ranks of the distributor if he is to make a success in life.

TRANSFERABLE VALUES

There is still room for improvement in the matter of the evaluation of the various subjects in the modern curriculum. Especially is this true when it comes to the transfer of credits from one type of institution to another, or the attempt of a student to transfer from one type of curriculum to another.

Numerous instances could be cited where students have found themselves at the end of a year or so in some special fields desiring to change their plans due to a change in their ideals for their future work, or perhaps due to a feeling that their limited experience in the special field had shown them to be unfitted for that work. Such instances would show that very little of the work which the students had pursued in the special fields from which they desire to transfer would be accepted for advanced standing in the other fields into which they desire to go. This is undoubtedly as it should be in many cases and yet in a great many cases such a decision is purely arbitrary.

It would seem that almost any conceivable course which had been intelligently pursued by a matured student under competent instruction should have some value in making up the total of one's educational equipment in any field. If a shop subject is so barren of real informational values as not to be recognized outside of its narrow field, it certainly is lacking in the basic factor that permits it to be rated as an educational subject. If it has such a body of rich thought material as will command a place as an educational subject, then it should have some recognizable or measurable value in the transfer of credits or in the shift from one curriculum to another.

Overhauling a Ford Generator

Roy E. Cahall and Fred Schaeperklaus,
Automotive Trade School, Cincinnati, Ohio.

The Ford generator is a four pole shunt wound machine, and it is equipped with a third brush which controls the charging rate. Since there are so many Fords in use, and no generator is perfect, the overhauling of a Ford generator is a frequent task.

The purpose of this discussion is to outline a method of making minor repairs without the use of expensive instruments. In fact, a screw driver, a pair of side cutting pliers, a Ford spark-plug wrench, and a soldering iron are all the tools needed for the job.

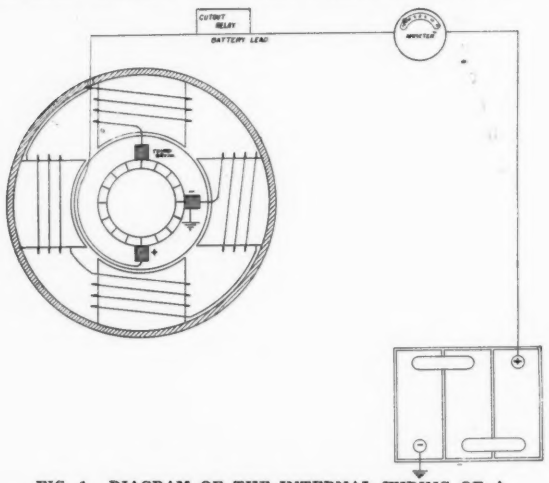


FIG. 1. DIAGRAM OF THE INTERNAL WIRING OF A FORD CHARGING CIRCUIT.

If the generator ceases to charge, the first step in the repair is to establish a charging circuit. Determine that there are no open circuits between the lead that runs to the cutout relay and the battery. To test this circuit, remove the lead from the cutout relay and touch it lightly to the frame of the car. If the lead sparks, the circuit is complete to the battery. If it does not spark, the circuit is open. When you have proved an open circuit, begin with the positive post of the battery and test each connection and wire by loosening it and grounding it to the frame of the car until the open is found, and the circuit established.

When the circuit is made and the generator will not charge, start the engine, and throttle it to a fair running speed. Then place the wire upon the brass post or bolt that leads from the generator. If the generator shows a charge with the wire in this position, the trouble is in the cutout relay. A defective cutout relay should be replaced by a new one.

All brushes should slide freely in the holders and should have sufficient spring tension so that, if the brush is lifted from the commutator and released, it will strike the commutator with a sharp click.

If the generator shows a heavy discharge of 10 or more amperes with the wire on the positive post and the generator running, there must be a heavy ground somewhere within the machine; while a no-discharge reading of the ammeter indicates an open circuit or high resistance in some internal connection.

The next step is to remove the garter cover and inspect the brush assembly to see that all brushes are making contact with the commutator, and to see that no bare wires are touching the frame of the generator. If they seem to be vibrating, hold the brushes in contact. The stranded wire running from the brush to the brush

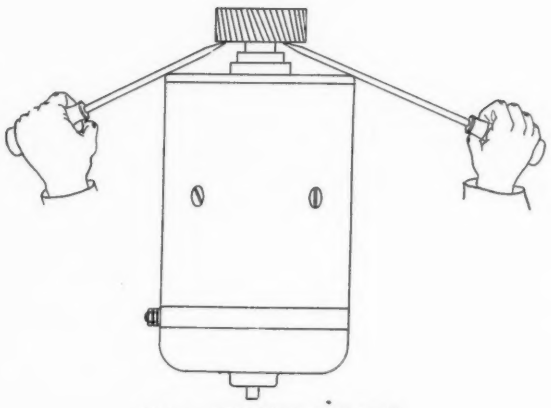


FIG. 2. REMOVING THE GEAR.

holder (called the pig tail) may be touching the metal frames of the generator, or the spring which holds the brush in contact may have slipped off the brush, especially the third brush, which is quite narrow. When the condition of the brushes and connections are inspected and found in good mechanical condition inspect the commutator. A bluish chocolate-brown is the usual color of a commutator in good condition. Note that there are no irregularities upon the commutator, or roughness of any kind. Rub the finger over the commutator. If the commutator feels greasy, and stains the finger, take a piece of 00 sandpaper, or clean rag dipped in alcohol, and hold it in contact with the armature while the engine is running until the commutator is bright.

If the generator still refuses to charge, it will be necessary to remove it. In order to do this, loosen the three studs that hold the generator in place to the engine (a new type Ford spark-plug wrench or socket wrench may be used).

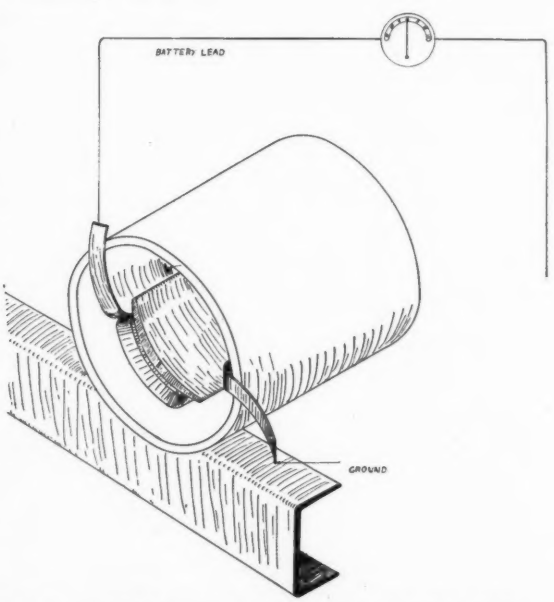


FIG. 3. CORRECT POSITION FOR MAKING THE FIELD TEST.

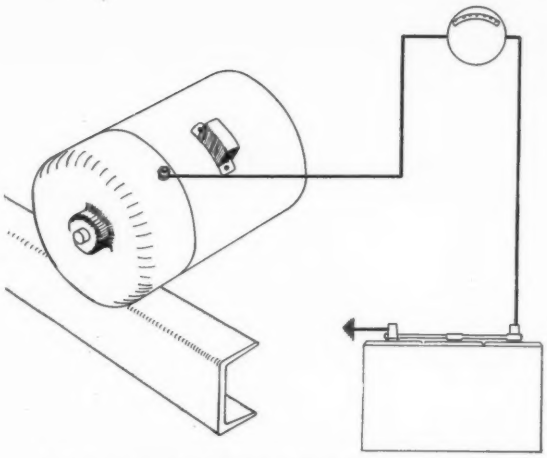


FIG. 4. CORRECT POSITION FOR MOTORING TEST.

After a Ford generator is removed, the next step is to remove the gear on the armature shaft. To do this, one must use a drift punch and hammer.

Since the pin that holds the gear is a taper pin, one should be careful to drive the pin out by hammering on the small end. Be careful so that the hammer does not strike the teeth of the gear and mar them. If the gear seems hard to remove, place two large screw drivers behind the gear and diametrically opposite to each other.

Now using the rear end housing as a fulcrum (or to pry over), apply pressure evenly to each screw driver until the gear slides off the shaft.

Place the gear, the pin, and the woodruff key in a box or bucket. Now remove the screws which hold the commutator housing to the yoke. Then remove the wires that come from the fields to the brushes, and the positive lead from the brass stud.

Insert a screw driver between the yoke and the commutator housing, and work the housing off the shoulder of the yoke. After the housing is removed, and the armature has been taken out, apply the battery current to the field leads. This may be done by laying the generator upon the frame of the car so that one lead touches the frame, and the other lead makes connection with the battery lead. If the contacts are good, that is clean and tight, the fields should draw from two to two and five-tenths amperes. Therefore, the ammeter should show a discharge of 2 to 2.5 amperes under this test.

Now to test the field for a ground, remove the field lead from the frame of the car and with the generator yoke in contact with the frame. Touch one of the field leads with lead coming from the battery to the generator. If the lead sparks, there is a ground in the fields. If the fields show a ground, unsolder the connections between each field in turn and test the field that is disconnected by the same test that was used to show the ground and proceed from field to field until the ground is found.

When the grounded field is determined, remove the metal forced into the slot of the screw by a drift punch or cold chisel. Now remove the screw and reinsulate the field by placing heavy parafined paper, or preferably, fish paper between the field coil and the metal parts that it touches. Replace the coil and draw it back into position with the heavy screw.

When you are sure that the field is in position, lock the screw by forcing some metal into the slot by a center punch. Resolder the field connections in the same relation that they were before (that is, do not change the ends that are soldered). Now, if one of the field leads is grounded, it will draw through the ammeter from 2 to 2.5 amperes, the fields are in good condition.

The brush ring assembly may be grounded for the accumulation of oil, carbon and copper particles may short the red fiber insulator to the metal ring. When a shorted brush ring is laid on the frame of the car and the positive or third brush is touched with the generator lead, it will spark. The negative or non-insulated brush, of course, should be grounded.

When the generator has been overheated, it is usually grounded or short circuited. If the insulation is burned until it is crisp, and if the armature and fields smell burned, or if there is any solder found within the housing or yoke, the generator is probably burned out If the generator armature is badly burned, it must be replaced by a new one. If the armature is grounded, it will spark when it is laid on the frame of the car, and the commutator touched with the generator lead. If the armature is neither grounded or burned, it may be open circuited. An open circuited armature will give excessive sparking when running. Some of the commutator segments are likely to be burned and roughened. If the armature is open, it will start motoring at certain positions when generator is being run as a motor and not at other positions. To run the generator as a motor, place the yoke on the frame of the car and touch the generator lead to the brass bolt in front. If the armature shows an open circuit, remove the cord binding about the wire near the commutator and examine the slots about the commutator to see if any of the wires are loose in the segments. Any loose connection should be soldered fast.

When the generator is reassembled, it should draw while motoring free, from 3 to 5 amperes, and should run smoothly at a fair rate of speed. The correct charging rate for a Ford generator is 15 to 18 amperes for city driving, and somewhat lower for long distance touring. The charging rate is controlled by the thin or third brush. To increase the charging rate, loosen the nut that holds the brush in position upon the brush ring and slide the brush forward in the direction of armature rotation until the proper charging rate is shown by the ammeter. To decrease, move the brush against armature rotation until the proper charging rate is reached, and then secure the setting by tightening the nut that holds the third brush in position. If the generator will not charge after the above described work has been done upon it, one should take it to an expert electrician where more technical tests may be made.

THE NEW YORK SCHOOL SURVEY

A "cooperative and constructive survey" of New York City's public schools has been ordered by the board of education. It is being conducted by a School Survey Committee, consisting of President George J. Ryan and Superintendent W. J. O'Shea with the help of several outside educators. The chief or directing assistant is Wm. H. Allen of the Institute for Public Service.

Asked what would be done respecting vocational and continuation schools, President Ryan gave the "INDUSTRIAL ARTS MAGAZINE" the following resume:

1. First of all, industrial-arts high spots, excellencies, or advance steps will be sought. These will include high spots of organization, equipment, supervision, methods, and program, and successes in teaching. In a recent school high spot radio contest, President Ryan explained why the school survey is looking for high spots. He said that he believed, with Supt. O'Shea, that the New York public would have more confidence in any constructive suggestions from surveyors who had seen not only high spots but low spots. The New York board wants to make best school practices contagious; wants to make it next to impossible for any excellence to be kept a secret; and wants the industrial-arts right hand to know what the industrial-arts left hand is doing.

2. Supervision of industrial-arts, including the continuation schools, will be studied by Supt. E. C. Hart-

well of Buffalo and Dr. S. A. Courtis of Detroit, with special references to ways in which the teachers in these schools are helped to grow while in service.

3. The preparation of teachers for vocational and continuation schools, more especially New York City's own method of preparing teachers for such work will be studied by A. N. Farmer, who is known to the middle west as a school superintendent of St. Cloud, Minn., and Evanston, Ill.; as surveyor of Wisconsin's rural schools, eight normal schools, and state university; as architect of the National Cash Register Company's school for salesmen; and more recently as educational director for the Yeomen in planning a five million dollar home-school for Yeomen's orphans.

4. The method used to examine and test teachers for vocational and continuation school licenses and for work in industrial-arts will be examined by several surveyors, including Dean J. W. Withers of New York University, Supt. E. C. Broome of Philadelphia; Supt. Hartwell, Dr. Courtis, Mr. Farmer and Supts. Paul C. Stetson of Dayton, O., and L. P. Benezet of Manchester, N. H.

5. The detailed study of the vocational and continuation schools, their program and methods of fitting instruction to conditions, will be made by L. R. Alderman, formerly state superintendent of Oregon and city superintendent of Portland, now educational specialist of the U. S. Navy. A number of specific questions have been propounded to Mr. Alderman respecting instruction and training in the practical arts. Fourteen questions include these two: In the so-called practical instruction observed, what, if any, advantages of program, organization, equipment, facilities and principle do you find lacking? Where, if anywhere, do you see opportunity for more "earning while learning" and "learning while earning" in connection with the activities under the board of education?

6. Finally, all the individual teachers in the industrial or practical arts in the New York schools have, of course, a personal interest, but also a personal responsibility for next steps in New York because President Ryan and Supt. O'Shea are asking for the fullest and frankest cooperation of all teachers and supervisors in this "cooperative and constructive survey" of the world's largest school system. A special request has already asked teachers and principals for constructive suggestions regarding the system's method of recruiting, selecting, examining and advancing teachers and supervisors. This is an opportunity for teachers themselves to make known any evidence they have that one method of examination, one type of test, is fairer to their field than another.

The INDUSTRIAL ARTS MAGAZINE is authorized by the School Survey Committee to invite information and constructive suggestions from any reader. Please address School Survey Committee, 500 Park Avenue, New York City.

Typesetting as a School Exercise

C. Neville Walker, Cass Technical High School, Detroit, Mich.

The movements involved in setting type from a California job case are not identical to those used when setting from cap cases, or a double lower case. In fact, each variety of cases set from requires somewhat varying movements by the compositor. To acquire speed, after accuracy, demands sufficient operations at each of the various cases to develop automatic habits of setting. These habits are habits of eyes, fingers, arms, body, legs, and even feet. Of course, the first necessity in composition is to *feel* the type into the stick. The same relation of mind, eyes, fingers, and arms must exist as when a person *feels* a morsel of bread from plate to mouth, or when the exact spot on the ear is touched upon which a fly has just alighted. The eyes must be kept looking ahead from one box to the next and selecting the next type to be picked up. Glancing at the stick, after each movement of the arm, to see if the type just put in is right in face and in position, will slow up the compositor. When the line is nearly complete, and before justifying the line, the compositor should glance along the whole line to make sure that each type is correct. Then is the time to make corrections and adjustments.

The first prerequisite to correct composition is that the general method of instruction be one suited to engendering specific habits and automatic responses. How to secure these automatic responses is the problem of the teacher. The psychological laws governing these acquisitions have been very definitely established: (1) attention, (2) repetition, (3) continuity of 1 and 2 without variation until automatic responses are well established.

The Class or the Individual, Which?

In the development of composing skill there are two needs which the printing teacher must hold balanced in mind: the general class need, and the need of each individual learner. The admission of printing into the program of school education gives the boy or the girl who is more than ordinary individualistic a chance for personal development without being a candidate for the reform school. Such a pupil is not compelled to "keep step" day by day even on the "seventy per cent with nothing below sixty per cent" basis with the others in the composing room. Draft horses and racers, hunters and truckers are in different classes.

No Class Drills

There is one feature in the work in the composing room which is not paralleled in any other school subject, and that is the absence of the necessity for class drills. In every imaginable case each individual in any class in any school possesses an entirely different equipment of particularized abilities, body or mental. In the printing class the pupil escapes that general prescription of class drills which are inevitably wasteful—worse, hurtful—because, in some members of a drill class, or even squad, undesirable habits are being fixed and abilities which they need are not being developed. In the composing room the pupil comes to the teacher as an individual, and the teacher has the problem of prescribing exercises and developing those ideas of form, space and relation which each particular case needs. There is all the difference in the world between drill and practice. Any pupil may be given all the practice necessary without drilling on points and particulars with others who need what he needs not.

Upon What Fundamentals Does Success in Printing Depend?

Quality and speed of setting depend, first of all, on memory. Ability to spell, to syllabize, to remember words in groups, to take in a phrase, a clause, a short sentence, so as to keep the eyes looking ahead for the next type to be picked up, is fundamental. Next comes deftness of touch, ease of arm movements, relative concordance of both arms. By watching a compositor at work, it may be noted that several factors enter into the production process: position, ease, movement, eye strain, character of copy, etc. Each of these factors is reducible into more elementary factors, which are definite muscular and mental adjustments with their attendant conscious and mostly subconscious processes.

Point Contact or Speed and Accuracy

Continual efforts should be made by the teacher to induce all pupils to set type so that a rhythmic swing of body and arms is brought into play. This should be done as early as is at all possible. Setting must pass from the

jumbling and jabbing and grabbing which the pupil does during the first week, ever nearer to a deliberate swing, growing smoother, quicker, and steadier.

It is very necessary to impress on each young compositor that accuracy must not be sacrified for speed; that, in fact, speed without accuracy is valueless; that the two are necessary for progress in the printing business, and that his posture of body as well as his power of attention to work in hand furthers or hinders his progress. Accuracy of setting or of spacing, and speed production are not simple but quite complex processes. Each is composed of many adjustments. Each adjustment of mind or body is constituted of factors which are resolvable into more elementary processes which are the result of specific habits or of specific abilities, any one of which gives a point of educational approach for the teacher to advance from.

Does Printing Involve Judgment?

The measure of a pupil's rate of setting in terms of the number of ems handled is definite; but the number of pieces of metal handled will always vary in the number and kind of spacing material used to justify every particular line in the job. Here enters a factor which is a valuable test of a pupil's judgment: How shall the line be justified? Shall it be wide spaced or thin spaced? Shall the word ending the line be divided or carried over?

Pupils and Tests

To secure a true measure of a pupil's accuracy and speed, a measured job should be given when conditions are favorable: conditions of case, light, health, etc. It should not be known that a measurement of skill is being made; as that puts a pupil into a different frame of mind than when setting under ordinary conditions, and may produce a state of nervousness, conscious or subconscious, which will affect the quality and the quantity of the production. The method of the unknown test is particularly wise to use with beginners. When a stated test is to be made it ought to be shorter and simpler than the test which is given unknown to the pupil. The unknown test is met by the pupil in a more nearly normal condition and is a truer measure of progress.

The Mischievous Pupil

As a class development need, a certain exercise may be given; a particular selection in prose or of poetry; the indentions may be specified, the length of line stated, the size of body determined, head, credit, and other details decided upon; all for the general good of the class. For the quicker lad the problem of enclosing in a border may be added. For the slower setter (a lad with less nimble fingers, eyes, or mind) a larger type body with corresponding length of line may be substituted. Should temporary grouchiness invite troubles, the stick may be laid aside and interest be found in arranging the furniture, the reglets, reassorting a border case, a rule case, etc. Instead of the old time "You may leave the room," the printing teacher wisely finds change of occupation a tonic for the sick-minded youngster.

Response to Instruction

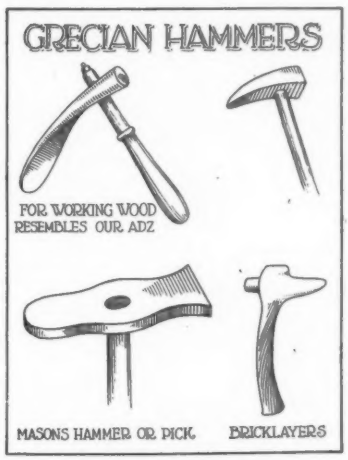
Pupils differ in their native ability and in their past experiences. Some pupils are eye-minded, some are ear-minded, and still others are motor-minded. These differences become prominent in their habits of learning. Some pupils grasp quickly the response to be made by seeing others perform it; others require a detailed explanation; and still others progress most rapidly by being allowed to reason out the appropriate response. Pupils differ in the amount of practice required to acquire ease of operation. There is no other subject on the school program that can equal printing as a means to obtain the requisite response from each pupil in the class in proportion to his powers.

Response to instruction is just as varied in pupils as are the individual equipments of specific abilities brought by them to the accomplishment of their school duties. Hence, the teacher of composition needs to have at his command a variety of ways of overcoming conditions peculiar to type composition which appear as stumbling blocks to the pupils. What is serious to one is a trifle to another; one needs a single explanation of a certain point on which another requires several. And the reverse may be true on another occasion. Pupils start out widely different, they continue so and they remain so. There is nothing to fear or regret about this; it is inevitable and is due to fundamental human characteristics. This makes it the business of the teacher not to squelch but to develop. Teachers must early in the course gauge the abilities of each member taking the course and endeavor to have each at least reach a reasonably set standard. Insofar as each pupil passes that standard, just so far has the teacher done that individual a worth-while service.

THE DEVELOPMENT OF THE HAMMER

Herbert D. Harper, New York

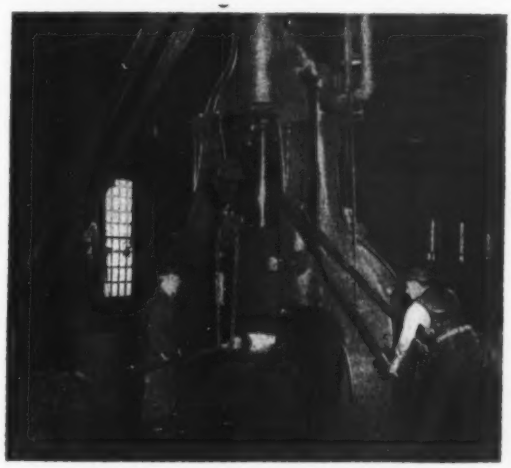
The word hammer is of Teutonic origin, although the hammer has a more ancient history than the Teutonic tribes, for from the time of Tubal Cain, the first blacksmith, down to the present time, it has been familiar in some form to every tribe and nation. There is no doubt



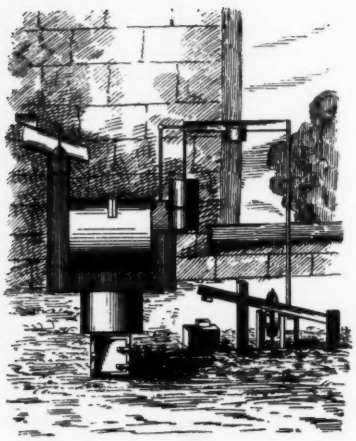
SOME OLD HAMMERS.

but that the first hammer was a piece of stone bound to a stick and was used by men in ancient times as a war weapon and continued to be used for that purpose just as much as an implement of peace until the middle ages.

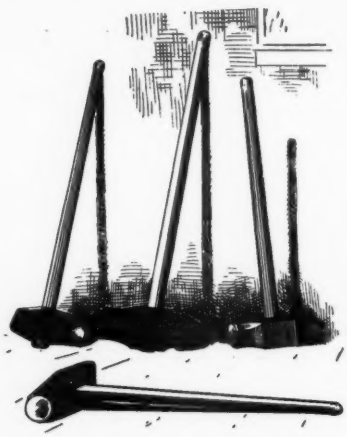
The hammer is mentioned in Scandinavian mythology as the weapon of Thor, the War God of the Norsemen.



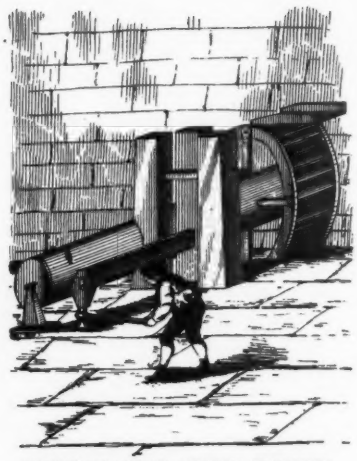
A MODERN STEAM FORGE HAMMER.
(Courtesy, Niles-Bement-Pond Co.)



FOOT POWER FORGING MACHINE.
U. S. Patent 1833.



PRIMITIVE SLEDGE HAMMERS.



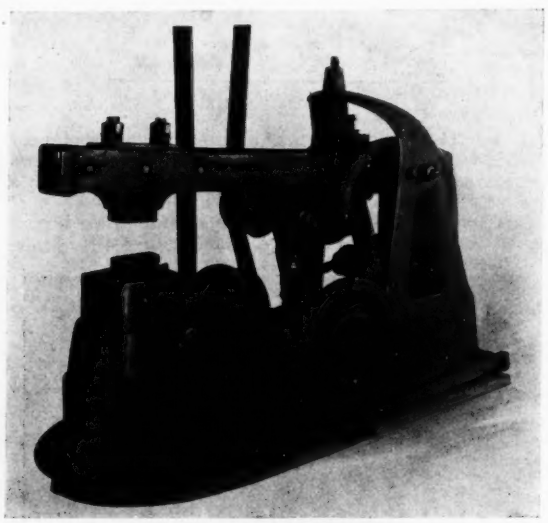
FRENCH WATER WHEEL FORGING MACHINE. (From an old picture.)

This hammer was of a peculiar shape which Thor could wield with terrific force to destroy ships, splinter icebergs and destroy mountains.

Many noted persons in history have been designated by the name hammer. Charles Martel who defeated the Saracens was called "the Hammer." Edward I of England was called "the Hammer of the Scots" and St. Augustine was called "the Hammer of the Heretics."

In the beginning of the tenth century with the growth of industry, the need of a heavier hammer than the ordinary sledge became evident. To overcome this need, the helve hammer used by iron workers and the Oliver used by smiths were invented. The first named was operated by gravity, being lifted by a circle of cams, while the second was lifted by a spring pole overhead and pulled down by the foot of the workman acting on a lever.

The first patent for a steam hammer was granted to Jas. Nasmyth of England in 1842. This steam hammer



OLD No. 7 BRADLEY HAMMER.
A steam hammer made by C. C. Bradley & Sons, Syracuse, N. Y., in 1874 and still in service.

was single acting, operating simply by gravity, the function of the steam being to lift the hammer for each succeeding fall. In the steam hammers of today, steam is imparted above the piston to give a more powerful blow below.

When America was being settled, our forefathers found the Indians using stone hammers and hatchets, and the first hammers made here were constructed on a blacksmith's anvil. How different are conditions today, a hammer for every special line of industry being obtainable from the very diversified line of over two hundred manufacturers. Some of the largest steam hammers in the world are in use in this country, one of which has a 125-ton hammer, the anvil consisting of three iron blocks, each weighing 70 tons.

STANDARDIZING THE RATING OF MECHANICAL DRAWINGS

John F. Faber and D. E. Kellogg, Erie, Pa.

THE rating of a finished mechanical drawing by a number of drafting teachers would show a vast difference in stressing various points of merit. One would rate a drawing ninety per cent, while another might rate the same drawing sixty or seventy per cent. This is accounted for, to a great extent, on the ground that few teachers agree on the relative merits of technique, in all its phases; the practical side of drawing, such as design, sketch, and whether drawing was copied.

This difference of opinion is bound to exist as long as teachers act independently. The writers are of the opinion that by combining a large number of different ratings, or ideas on rating, and determining the average, a fairly workable method could be devised. The value of such a system, universally practiced, is inestimable. It would tend to bring all schools into closer union and be a fair step toward the solution of the problem.

Toward this end the accompanying rating chart is submitted as a basis for criticism. It is used in the public schools of Erie, Pa., and has brought results through improved drawings on the part of the student and more intelligent rating on the part of the instructor.

Design is rated separately because this branch of mechanical drawing is not studied in many classes and not usually until the third year. Practicability is interpreted as capability of being put into practice; Usefulness, as being of service; Simplicity, as simple of construction, or of low production cost; Adaptability to construction, as being adapted to the machines in the shops; and conformity, as correspondence in form or character, beauty, and pleasing to the eye.

The vast majority of drawings made in schools may be graded on the basis of the freehand sketch and instrumental drawing, for few drawings are designed and not all are traced. If the student's instrumental drawing is a reproduction of a drawing from a textbook or blueprint, there has been very little thought necessary on the student's part. Such drawings are instrumentally the student's and no more. For this reason the highest grade given such work according to the chart is forty per cent. If the drawing was made from a freehand sketch, which had previously been made by the same student, from the object or pictorial representation of the object, the drawing would be rated on the basis of one hundred per cent.

The School District of the City of Erie, Pa.
VOCATIONAL DEPARTMENT
MECHANICAL DRAFTING RATING CHART

DESIGN-100%

Practicability	30
Usefulness	25
Simplicity	20
Adaptability to construction	15
Conformity	10

SKETCH-60%

Selection and arrangement of views	25
Dimensioning (choice and arrangement)	10
Completeness of views & information	10
Lettering	5
Technique of lines	4
Judgment of size and proportion	3
Speed	3

INSTRUMENTAL DRAWING-40%

Technique of lines	10
Lettering	10
Neatness and general appearance	5
Completeness of necessary information	5
Connection of tangents	5
Accuracy to scale	3
Speed	2

INKING OR TRACING-100%

Technique of lines	30
Lettering	25
Connection of tangents	20
Speed	15
General appearance	10

Note-Chart not used in Architectural classes

Inking or tracing is rated separately because all drawings are not traced or inked. Again, in some schools where pencil drawings are inked it is possible to lower the final mark of a pencil drawing rated highly, if inking was not considered separately.

All teachers will not agree with the divisions and subdivisions to be rated, or the values placed after each. This difference of opinion, without action, will not make possible the solution of the problem. If everyone reading this article will send his criticisms to the writers, it will be possible to get a fair idea of the subject from the teachers' standpoint.

This rating scale, has been sent to one hundred commercial drafting rooms in different cities throughout the country in an attempt to get the practical draftsman's point of view.

School District of City of Erie, Pennsylvania
Vocational Department
MECHANICAL DRAFTING RATING CHART

		CHIEF DRAFTSMAN'S RATING
DESIGN 100%		
1. Practicability	30%	
2. Usefulness	25%	
3. Simplicity	20%	
4. Adaptability to Construction	15%	
5. Conformity	10%	Total %
SKETCH 60%		
Selection and Arrangement of Views	25%	
Dimensioning (Choice and Arrangement)	10%	
Completeness of Views and Information	10%	
Lettering	5%	
Technic	4%	
Judgment of Size and Proportion	3%	
Speed	3%	Total %
INSTRUMENTAL DRAWING 40%		
Technic of Lines	10%	
Lettering	10%	
Neatness and General Appearance	5%	
Completeness of Necessary Information	5%	
Connection of Tangents	5%	
Accuracy to Scale	3%	
Speed	2%	Total %
INKING OR TRACING 100%		
Technic of Lines	30%	
Lettering	25%	
Connection of Tangents	20%	
Speed	15%	
General Appearance	10%	Total %

Manual Arts "Monkey Puzzlers"

Charles P. Coates, St. Louis, Mo.

A. Completion and Elimination Test
(Select for maximum score of 40)

Score

1. In getting out stock in the rough (in stock-room), the boards are properly placed upon..... 1

2. The names of the planes which are placed upon the tops of the manual training work benches are as follows: Fore Plane, Jack Plane, Dado Plane, Router Plane, Block Plane, Trying Plane, Smoothing Plane and 2

3. The principal parts of the jack plane are (1) (2) ..... (3) ..... (4) ..... (5) ..... (6) 2

4. In adjusting the cutting edge of the plane bit to the plane stock (or plane bottom), the adjuster should sight along the....and from the.... end of the tool. 2

5. In squaring up stock the plane should always be moved parallel to the edge of the work bench. When the plane is skewed or pushed at an angle to the edge of the bench, a true surface is not formed because 3

.....

6. The plane is properly "skewed" or pushed at an angle to the work only when one wishes to plane. 2

7. In planing with the grain the splitting of fibers in advance of the plane bit edge is prevented in two ways (1).....(2)..... 2

.....

8. In making the return stroke the plane should be tilted or raised to prevent..... and to.. 2

.....

9. Face marks should be placed upon.....of the four planed surfaces of prepared stock..... 1

10. When not in use, the plane should be placed .....in order that..... 1

11. The plane cap (chip-breaker) serves a two-fold purpose—to break the shaving and to prevent... 2

12. It is necessary to press firmly down on the knob of the plane at the beginning of a stroke and to press down on the handle at the completion of the stroke. The reasons for this practice are listed below 3

.....

.....

13. Plane irons and chisels should be ground at an angle of approximately....degrees, and whetted at an angle of....degrees..... 2

14. The corners of the smoothing plane bit should be slightly rounded on the oil stone. If the bit were used without having its corners shaped in this fashion 2

.....

15. A square is an angle of....degrees and the ....of a circle..... 2

16. The names of the parts of the square are.. 1

17. The try square is properly used to test.... .....and to serve as a..... 2

18. The graduations found upon the try square are for the purpose of enabling one to..... 1

19. The T bevel is used for the purpose of laying out and testing..... 1

20. The marking gauge is properly held in the hand 1

21. The names of the parts of the marking gauge are as follows..... 2

22. Knife lines and gauge lines are preferable to pencil lines when one wishes to..... 1

23. Bevels and chamfers are laid out with the pencil gauge, and for the following reasons..... 2

.....

Score

24. The numerals stamped upon the heel of saw blades indicate 1

25. A dull saw is put in condition by (1)..... (2) ..... (3) 2

26. One may readily distinguish rip from cross cut saws as the teeth of cross cut saws are filed to..... .....while those of the rip saw are filed to..... 2

27. The names of the saws employed in the making of our skeleton-type foot-stool are the compass, rip, miter, hack, tenon, cross-cut, key-hole, back, scroll, and .....saw..... 2

28. When used as a measuring instrument, the rule should be placed..... 2

29. Craftsmen always measure, gauge, and square all mortise and tenon lines from the working face, working edge, and knife-lined ends because.... 3

30. When two pieces of stock are glued together (edge to edge), dowels are inserted into the edges of the pieces. These dowels are not primarily for the purpose of holding the two pieces together, but for the purpose of..... 3

.....

31. During the year, the instructor demonstrated at the work bench the making of the following cabinet or woodwork joints..... 2

32. A screw driver is a tool used for the purpose of.....screws and for the purpose of..... 1

33. A countersink is a tool used for the purpose of.....flat-head screw 1

34. Mallets are properly used to drive..... 1

35. Glued-up work should remain at least.... hours in the clamps to harden..... 1

36. When cabinet scrapers are to be put in order, the following tools should be available..... 2

.....

37. White oak lumber is not infrequently quarter-sawn to improve the appearance of the furniture into which it is made, and also to..... 1

38. In sawing waste material from the ends of wide pieces of lumber, the stock should be placed in the vise with..... 2

.....

39. Fuming is a process of coloring white oak and chestnut by means of..... 2

True and False Test

(Select for maximum score of 25)

1. The exact age of a felled tree may be determined by counting the number of annular rings found upon the stump..... 2

2. The proper method of laying out the width of a piece of stock is "to rest the gauge against the marked edge, and then pull it the length of the board on both faces."..... 2

---

3. A superior kind of glue is made from milk.. 2

4. Mortises should be beaten out rather than bored and trimmed, "because it is the old-fashioned method." 2

5. Some species of timber possess a grain which runs in several different directions..... 2

6. The phrase "set of a saw" has reference to the dullness or sharpness of the teeth..... 2

7. The number twelve stamped upon the shank of an auger bit indicates that it is a number twelve bit 2

8. Commercial sandpaper is made of ground glass glued to tough paper..... 2

9. When one wishes to whet a chisel, oil should be placed upon the oil-stone to soften the material of which the stone is made..... 3

10. Shellac is made from a substance secreted by a certain kind of insect..... 2

11. Linseed oil is a good oil-stone lubricant.... 2

12. After two pieces of wood have been glued together it is well to remove the surplus glue which has oozed out along the joint with a warm damp cloth 2

13. An empty tea-caddy (can) makes an excellent shellac receptical..... 3

14. When marking gauges are new and the graduations are easily distinguished on the beam, one need not employ the *rule* to set the gauge for width 2

15. If manufacturers would insert gauge-spurs at an angle to the beam, instead of at 90 degrees, the necessity for rolling the gauge would be done away with..... 2

16. The width of a saw-kerf is determined by the thickness of the saw blade..... 2

Manual Arts Practice Test

(Select for maximum score of 35)

1. Give the sequence of steps employed in the process of squaring (or preparing from rough material) a piece of stock which when finished will measure 10x3x⅞..... 10

2. Illustrate by means of thumb-nail sketch the Lumberman's method of ripping slash-sawn and quarter-sawn lumber 6

3. Outline two methods of boring through-holes in prepared stock..... 4

4 Make sketches of the several joints made during the term..... 4

5. Locate on dimensioned sketch mortise lines for table leg in "Exhibit B."..... 4

6. Give the technical names of the several parts of the piece of cabinet work marked "Exhibit A."... 2

7. With the aid of sketches, show the difference between (1) A bevel and a chamfer; (2) A through chamfer and a stop chamfer..... 4

8. Why is it necessary to square all lumber before employing it in cabinet construction..... 3

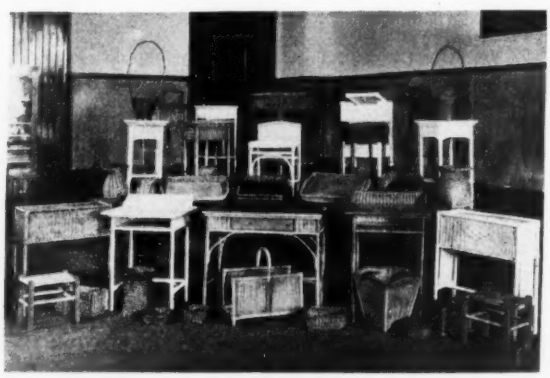
9. Outline the sequence of steps in plane-bit whetting 2

How Baltimore Charts Its Vocational Plans

Superintendent Henry S. West has provided an outline of the vocational activities engaged in by the Baltimore school system. A diagram prepared by the vocational education department is presented which tells:

1. That there are three units in the Division of Vocation education: Industrial and Commercial training, and Home Economics.

2. That there are six types of vocational schools: All day schools, continuation schools, evening schools, part-time cooperative schools, dull-season schools, summer schools.



PROJECTS IN WEAVING MADE BY STUDENTS
of the Traverse City High School, Traverse City, Mich.
G. E. Hannan, Director of Industrial Arts.
The work represents a portion of the manual training shop practice during the Spring semester, 1923.

Cultivating Standards of Taste

Charles A. King, Plymouth, N. H.

ONE whose native appreciation of the beautiful has been fostered through childhood, amid a cultured environment, who has spent much of his later life in the study of the beautiful purely from the love of it, as a vocation or as an avocation, listens to the effusions upon art by the parvenu or the superficially artistic with either amusement or exasperation. Usually such outbreaks indicate the absence of an adequate background for an intelligent opinion upon any subject pertaining to art. In most cases the opinions are either parrot-like or based upon personal preferences, whims, or notions, and form a type of philosophy which may be called "Fordian," for want of a ready-made generic term. Such individuals settle to their own entire satisfaction all question in every realm of human, economic, national, and international interests by personal opinions or conceits. With a wave of the hand to indicate finality, the exponent of this school of philosophy sweeps aside as "bunk" the unknown, or the inconvenient accumulation of tested knowledge, based upon the thought of the most brilliant minds which have guided the travail of civilization during centuries.

From the mass of fads functioning in physical and social environment of past generations, certain basic principles of good taste have isolated themselves by the force of their own proved fitness in meeting the needs of the finest contemporary culture. These have been modified and adapted to the varying phases of artistic expression of different periods and nations, based upon racial characteristics, religion and physical environment but in every case, conformity to time tested basic principles is evident. Thus, the present standards of good taste have been evolved, and are recognized as being fundamental by all students and specialists in art. Certainly these broad principles are not based upon the artistic vagaries of any contemporary group or school of faddists. Temporary lapses and freaks of fashion are usually based upon commercial propaganda, and sway the mass of those whose conception of good taste is limited by the degree of exactness of conformity to the latest fad in dress, personal accessories, and home furnishings. The cultured mass, however, realizes that standards of taste are founded upon age-old laws, which have evolved as naturally as have the laws of economics and hygiene and in the long run are as positive in their functions. They create their environment accordingly.

But even these established laws are subject to a degree of modification and individual interpretation in the direction of the prevailing fashion, for the first element of good taste is offended if one's manners, dress, home, or personal accessories are so conspicuously at variance with the prevailing mode that attention is attracted thereby. Usually the middle ground of good taste may be attained by those whose innate sense of eternal fitness impels the exercise of thought to that end, though there are times when a modestly and inconspicuously dressed individual will become conspicuous by those very characteristics. Though such times come and pass, fundamental laws are everlasting, and in the long run the ability to discriminate between the standards of good taste and the prevailing fashions and fads, will result in conformity to the basic principles of good taste in personal appearance and in home furnishings.

The uplift in the standards of taste of the present generation in homes and furnishings, is due to the inter-reaction between better trained designers and the young people whose training in the manual arts, domestic arts and art classes functions in the selection of furnishings for their new homes. The curricula of these industrial and household arts departments should be enriched by injecting more specific study of the appreciation of standards of taste in home building, decoration and furnishing, and to the discrimination between fads and fashions, and good taste in individual clothing. Every one may acquire appreciation of what few may produce.

The fact that many seem to have absorbed little of such instruction at school should not be laid at the door of the present educational system, for that shortcoming may be explained by the influence of early environment. Many parents of the present generation had few, or no cultural, advantages in their youth and are content with a home in which the existence of standards of taste is ignored. Often the loyalty of the child to his parents permits him to acquire no more than a superficial appreciation of standards of taste, which is speedily forgotten because of the lack of sympathetic home environment.

If our parvenu friend has partaken unduly of unsuitable nourishment, his autonomous nerve system telegraphs his consciousness that something is wrong with his digestive apparatus; an appeal to the doctor is the logical result. For has not the doctor made a study of the ills to which the flesh is heir, and their remedies? If he finds himself involved in a difference of opinion with his neighbor on the north regarding the location of the boundary line between their respective real estate holdings, the services of an attorney are enlisted. For has not the lawyer made a study of the intricacies of the before mentioned and the wherefores, which are the despair of the layman, hence the stock in trade of the lawyer? But often, when he decides to build and furnish a home, he ignores the fact that the architect and decorator have spent quite as many years to become proficient in their work, as have the doctor or the lawyer in preparation for the practice of their profession, and that the natural gifts which make possible a high degree of proficiency in either case are equally rare.

Often the fees of these specialists in the standards of taste are considered an unnecessary expense for he "needs no one to tell him what he likes;" hence the house, furnishings, wall paper and draperies are purchased with little regard for unity. Each item is selected separately, the only consideration being the degree of liking of the purchaser for each article, as it occurs or is presented to him by a salesman who rejoices at such an "easy" customer. Such purchasers are oblivious to the fact that the ensemble of wall paper, furnishings, floor coverings and hangings of each room and of adjoining rooms will ever be an important psychological factor in the liveableness of the home he is endeavoring to create. Even a stolid and phlegmatic individual will in time develop a case of nerves if a room papered with a staring red wall paper with flashes and spangles of gold, and furnished with nondescript and haphazard furniture and hangings to accompany his daily dose of home life. Because of the longer exposure to the stimulus and the greater sensibility of feminine nerve processes, his wife experiences a similar but more intense effect, perhaps resulting in headaches and nerve complications. The time has passed when the mother of a family is proud of an ultra-sensitive nervous system, for usually such a condition results from a degree of ignorance of the essentials of a home, which is inexcusable in an intelligent modern home-maker.

While the popular standards of taste are still far from the levels which will be attained in years to come, when the people will demand artistic homes and all pertaining thereto, have we not, despite the strenuous modern life surmounted the foothills of artistic progress? Do not the American artists, Sargent, Abbey, Innes, Whistler and others, rank with the best of their European contemporaries? These men are exceptions, as are all who attain eminence in their respective professions but they dispose of the notions of the superficially artistic and of the "Europo-maniac" that America cannot produce worthwhile art. It is safe to predict that but a few more generations of children will experience the school environment of good taste so that the mass standard of taste of all the people will make it unprofitable for the manufacturers to

produce articles of utility not conforming to certain standards of good taste.

The European artist, or artisan to be, is surrounded with the accumulated beauty and tradition of centuries of artistic endeavor. He seldom, perhaps never, comes in contact with the type of decorations and furnishings produced under American conditions of mass production, with which many of the homes of the masses of our people are furnished. From such homes the ranks of our workers are recruited. Nautrally they perpetuate the ideal of mass production in a more efficient degree. For it is in the main true that the term "efficiency in production" refers to cheapening the cost of production without sacrificing the essential quality of the product, quality referring to durability and utility rather than to artistic form and proportion.

Whatever may be the heredity of the child, his home, school, and social environment are largely responsible for his habits of thought, viewpoints of life and involuntary reactions to external stimulae. Usually these are formed before he is 9 years of age. Hence, it is not difficult to understand why the European artisan rebels at the idea of mass production which at present dominates American industry, and clings to the finer craftsmanship and higher standards of taste demanded by the individual production of beautiful furnishings, decorations and textiles in which he is at his best, and which alone satisfy the most highly discriminating purchaser.

The age-old environment of artistic atmosphere, apprentice system, schools and the long craft training of European artisans are the bases for European supremacy in the creation of art products. We can compete with them adequately only when the artistic perception and appreciation of the masses are moulded by education and made to function in even the humblest homes, in which each succeeding generation must spend its pre-adolescent years. For the impressions and habits of thought there acquired dominate later adult life. Success in training an artisan depends on the mental attitude with which he approaches his work. The American mass ideals of craftsmanship, based upon methods of mass production, preclude the possibility of acquiring the viewpoint of the artisans of the older art and industrial centers of Europe. Not until we have created a nearly universal physical environment, similar to that in which the European craftsman-to-be absorbs an appreciation of beauty and of trade ideals can there be an adequate supply of native American recruits willing to spend the time and work necessary to master the art trades now largely carried on by European workmen.

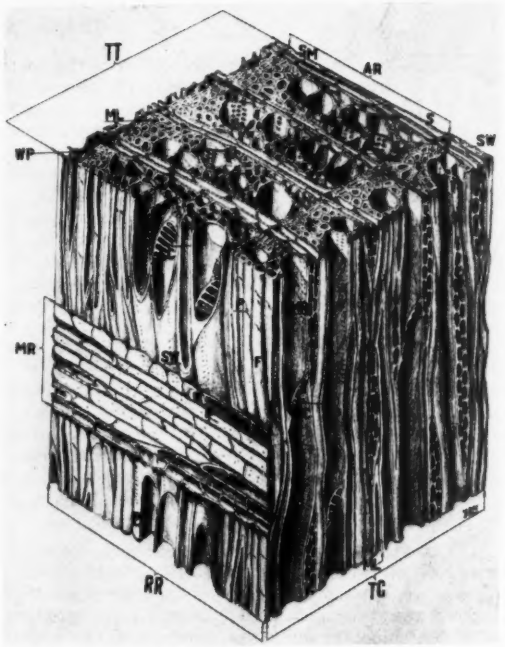
It may be said that the medium-priced products of our American furniture industry are some steps ahead of the appreciation of the mass of the people. The enterprise of the manufacturers is an important factor in elevating public discernment and in creating a demand that all furniture and household accessories conform to higher standards of taste. These men realize that even the most modest articles of utility must have artistic merit. Because an article is to be produced in quantity is no reason why its form and proportions should be atrocious. Familiar mechanical processes may be adapted, and new ones devised, to the end of creating beauty, quite as well as they are now applied in making the bad to mediocre products.

NEW ERA IN APPRENTICE TRAINING

"The value of apprentice training in the building trades is seen in the fact that the training and proper employment of apprentices is a problem of first importance to the entire community," said Dwight T. Happingarner of the American Construction Council before the Department of Vocational Training. He continues:

"In fact, the training and proper employment of apprentices is a problem of first importance to manufacturers, employers, labor, realty and building interests, investors, and home owners, being a very important factor in construction costs and equally important in giving an adequate outlet for the products of the manufacturers of materials used in construction. But an even more fundamental consideration is the fact that the dignity of craftsmanship and the training for its proper pursuit have too long been neglected for the building trades.

"Quality of craftsmanship and respect for the crafts rather than a mere numerical increase in the number of mechanics is the aim of the council's program on apprenticeship. The council's efforts are devoted particularly to the development of teaching materials and methods for use throughout the country and in the general promotion of apprenticeship commissions and other agencies which actually conduct the training, as the council itself does not conduct apprenticeship schools of its own. In this program on apprenticeship the council is also exercising every effort to assist in the stabilization of the construction industry as the question of apprenticeship and stabilization are inseparably linked together in that apprentice training is futile unless there is adequate employment for those trained, both throughout the year and from year to year."



CELL STRUCTURE OF HARDWOOD.

This drawing of the cell structure of a minute block of hardwood was made in the course of studies of the physical properties of wood at the U. S. Forest Products Laboratory. Although the microscope cannot bring several planes into sharp focus at the same time, as this drawing does, it was by means of studies of various thin sections with the microscope that the drawing was accomplished. The block shown here was less than ¼ inch high.

Wood, instead of being a relatively solid material, is seen to be composed of many conducting tubes and fiber units cemented together. The larger tubes are specialized cells which serve to conduct the sap. The fibers serve primarily to give strength to the material.

The top surface TT of the block corresponds to the top surface of a stump or to the end surface of a log. The larger openings V on this surface are sap-conducting vessels, or pores, built up of short cylindrical cells joined to one another at the ends. The presence of these pores, which in many species are visible without the aid of a lens, helps to distinguish a hardwood from a softwood, the latter being made up of smaller cells of fairly uniform size. The pores are usually larger and more numerous in the springwood S or wood formed early in the growing season, than they are in the summerwood SM which has more of the smaller wood fibers F. Together, the springwood and the summerwood cells make up the annual ring AR. One such ring is added to the outside of the tree each year.

The left side surface RR represents a vertical plane along the radius of the trunk. The grating-like splices SC of the pore units are shown on this surface, as well as the pits P through which sap may pass from cell to cell. The medullary ray MR is one of many chains of short cells which radiate from the center of the tree and serve to store food material and to distribute it horizontally.

The surface RR is called "quarter-sawed" in hardwoods. The attractive figure of large lustrous flakes, made by medullary rays entering and leaving the plane of the saw, causes some quarter-sawed hardwoods such as oak and sycamore to be highly esteemed as furniture woods.

SW is the secondary wall, a thickening or deposition laid down by the living cell. ML is the middle lamella, a cementing substance between the cells.

The surface TG at right angles to the quarter-sawed surface, corresponds to the flat grain or plain-sawed surface of lumber.

PROBLEMS & PROJECTS

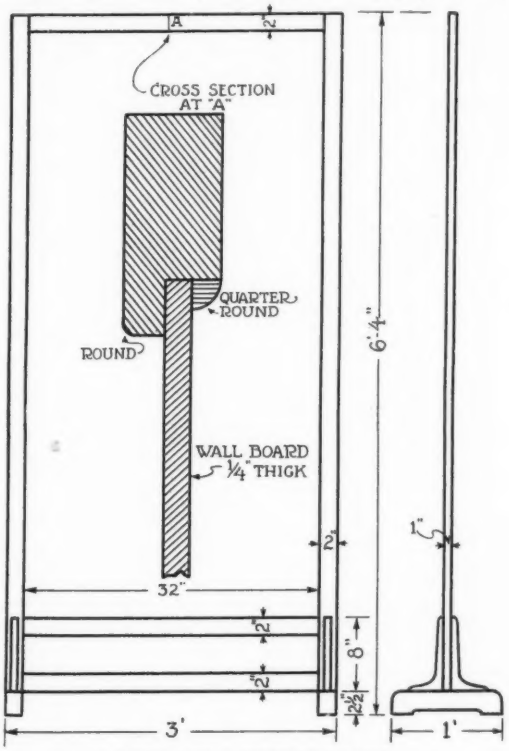
This department aims to present a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, pattern-making, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

A DISPLAY AND BULLETIN SCREEN

C. A. Kunou, Supervisor of Manual Training, Los Angeles, Calif.

The screen illustrated in the accompanying sketch was designed by the writer for the Los Angeles schools and has been made by manual training pupils for the



DETAILS OF A DISPLAY BOARD.

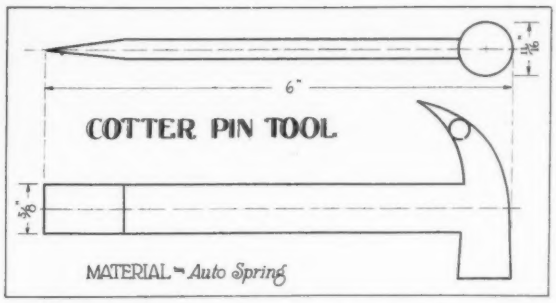
drawing departments of grade schools. It is used to hang specimens of drawings particularly where these are to be displayed at meetings of teachers. It is used also for a bulletin board and exhibition screen.

COTTER PIN TOOL

O. L. Hedrick, Laurel, Nebr.

The cotter pin tool should be in the kit of every auto mechanic. It makes an excellent project for the class in forge work, as its construction necessitates the use of many of the fundamental operations.

The material may be any tool steel of the proper carbon content. In looking for a cheap source of material I found that pieces of broken auto springs would prove satisfactory for the construction of this tool. When constructed of auto spring, the tool will stand any normal use that it should be subjected to, but will not stand abuse.

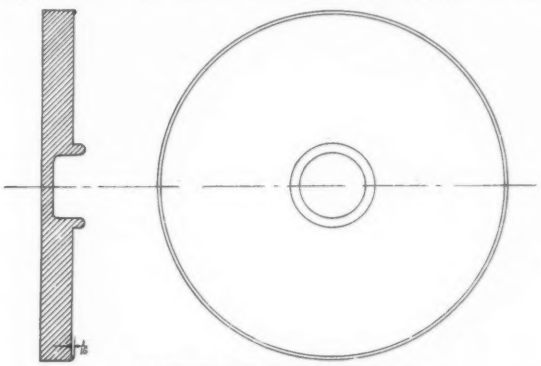


I find the best way to forge out this tool is to upset one end of the piece of spring sufficiently to obtain enough material to make the head, then cut out a T shaped blank and forge to specifications. I prefer to temper the tapered end with water, as oil does not make it sufficiently hard.

A SCHOOL SHOP PALETTE

James K. Shallenberger, Silverton, Colo.

This palette was designed to meet a need in the shop for a mixing board for tube colors. It will be found most convenient where toys are to be painted, or templets or signs are to be made. It is greatly superior to any



PALETTE FOR SHOP PAINTING.

random scrap of wood or piece of glass which are so often used.

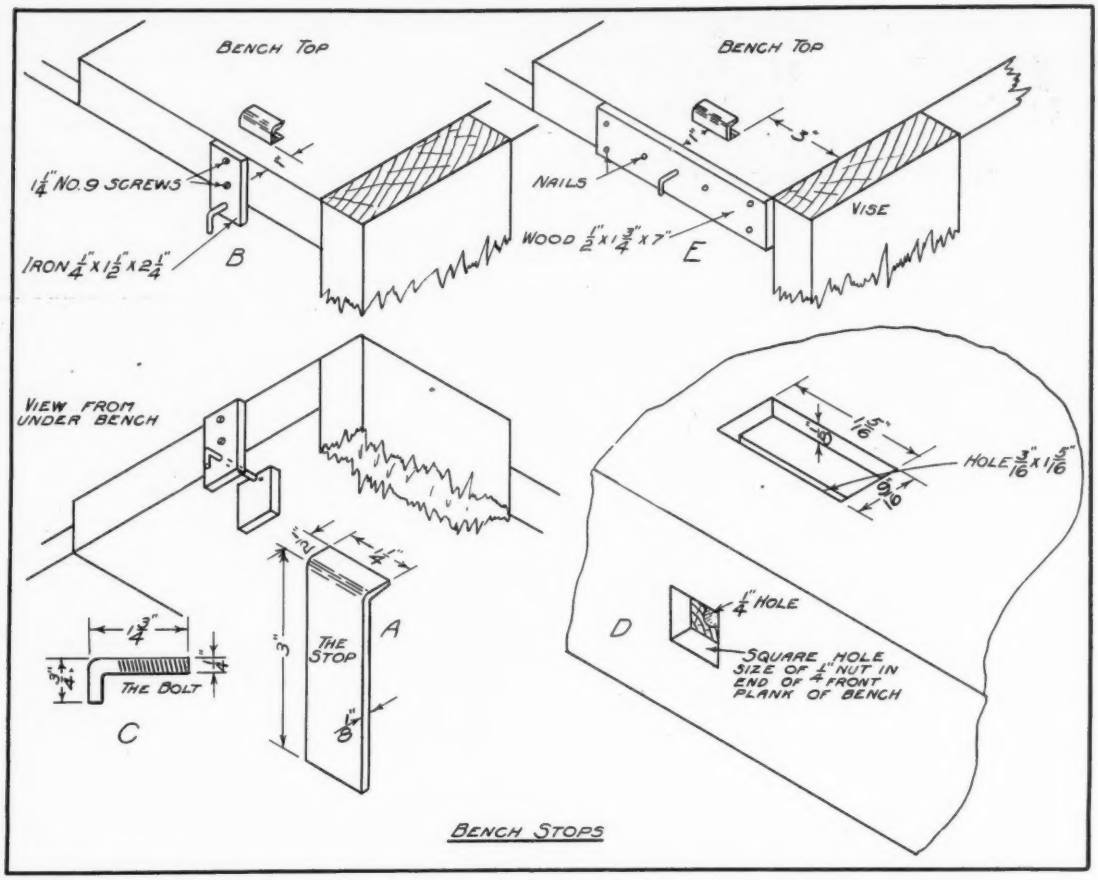
The dimensions are optional, but a seven-inch diameter with a 1¼" cap will serve most amounts. The rim around the outside edge should not be more than 1/16". A greater height makes cleaning more difficult and tends to make the boy mix more paint than he needs. Red birch makes the best material, though beech or maple are perhaps as good.

BENCH STOPS

Louis M. Roehl, Ithaca, N. Y.

The bench stops, which are shown in the drawing, are easy to make and attach on the bench, are easy to adjust to any desired height, and drop down out of the way readily. The drawing shows two, both of which have been found satisfactory for single benches.

The one at the left on the sheet consists of three pieces of iron and two flat head wood screws. The stop is shown at A and consists of a piece of iron ⅛"x1¼"x3½". One-half inch of one end is bent at a right angle as shown at A. The end, which is bent, may be forged, filed, or ground to as sharp an edge as desired. The plate consists of a piece of iron ¼"x1½"x2¼", which is held to the end of the bench with two 1¼" No. 9 wood screws as shown at B. A 3/16" hole is bored in the plate just below the top plank of the bench on which it is to be used. This hole is threaded with a ¼" tap. A ¼"x2½" rod is threaded and bent as shown at C in the drawing, or a ¼" bolt is cut to the same dimensions and bent. The bolt is placed in the hole in the plate as shown



DETAILS OF BENCH STOPS.

at B. A slot is made in the top of the bench at a point about one inch from the front edge just large enough for the stop to work up and down freely. A depression is made in the top of the bench so that the bent part of the stop will drop down flush with the top where it will be out of the way when not in use. A mere turn of the bolt holds the stop at the desired height and also releases it.

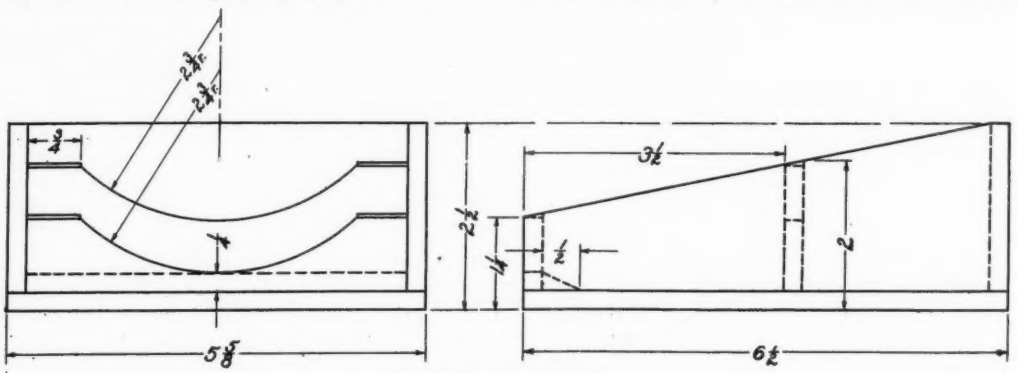
The two drawings at the right in the plate show another method of holding the stop in place. As shown at D, a square hole the size of a ¼" nut is made in the end of the top plank of the work bench. A ¼" hole is bored into the plank to the slotted hole. A ¼" nut is placed in the hole and held in place with a piece of hardwood ½"x1¾"x7" as shown at E. A hole is bored through the wood block for the bolt to project through.

Either of these bench stops is especially desirable for farm shop work benches where it is desired to use the top of the bench for a great variety of work.

NEW TYPE CARD FILE

Kenneth R. LaVoy, Instructor in Woodworking, New Rochelle, N. Y.

The card file shown in the drawing is designed to hold standard cards, 3" by 5". It can be used in so many ways that every boy will want to make one to take home. Suitable index cards, of course, give it varied uses. The boy's mother can use it as a handy reference for cooking and baking recipes, for keeping bills, receipts, etc. His father would be glad to have a ready file for hints culled from magazines on the care of automobile, garden, or house. And the boy himself can use it for radio informa-



A NEW TYPE CARD FILE.

tion, book lists, or special information along some line in which he is particularly interested.

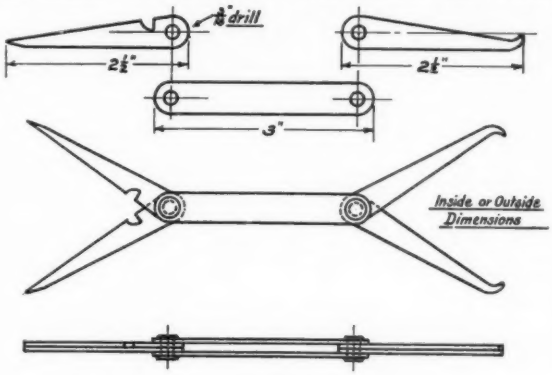
The convenient feature of this card file is the two separate compartments. The front compartment is intended to hold a reserve supply of new cards. In this compartment the cards lie flat. The other space is for filing. Here the set of index cards is placed on edge. Thus, new cards are always ready at hand when wanted, and as soon as filled out they can be easily and quickly filed away.

It is a very satisfactory problem, covering, as it does, many tool operations, such as squaring, rip and cross-cut sawing, straight planing and planing at an angle, coping saw work, sanding and nailing.

COMBINATION CALIPERS

F. D. Connard, Webster Groves, Mo.

A problem in flat tool steel suitable for metal working classes. This tool can be used as inside and outside



COMBINATION POCKET CALIPERS

TOOL STEEL

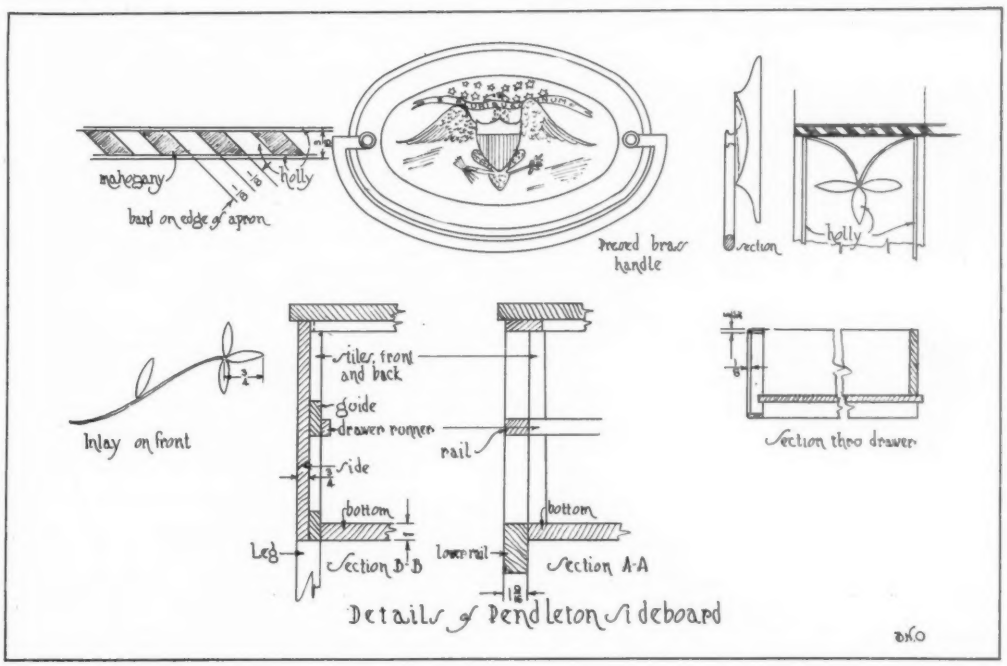
calipers by reversing the two arms. Soft, common rivets may be used in fastening or can be made by turning out on the lathe with a washer to fit and riveting the washer after assembling.

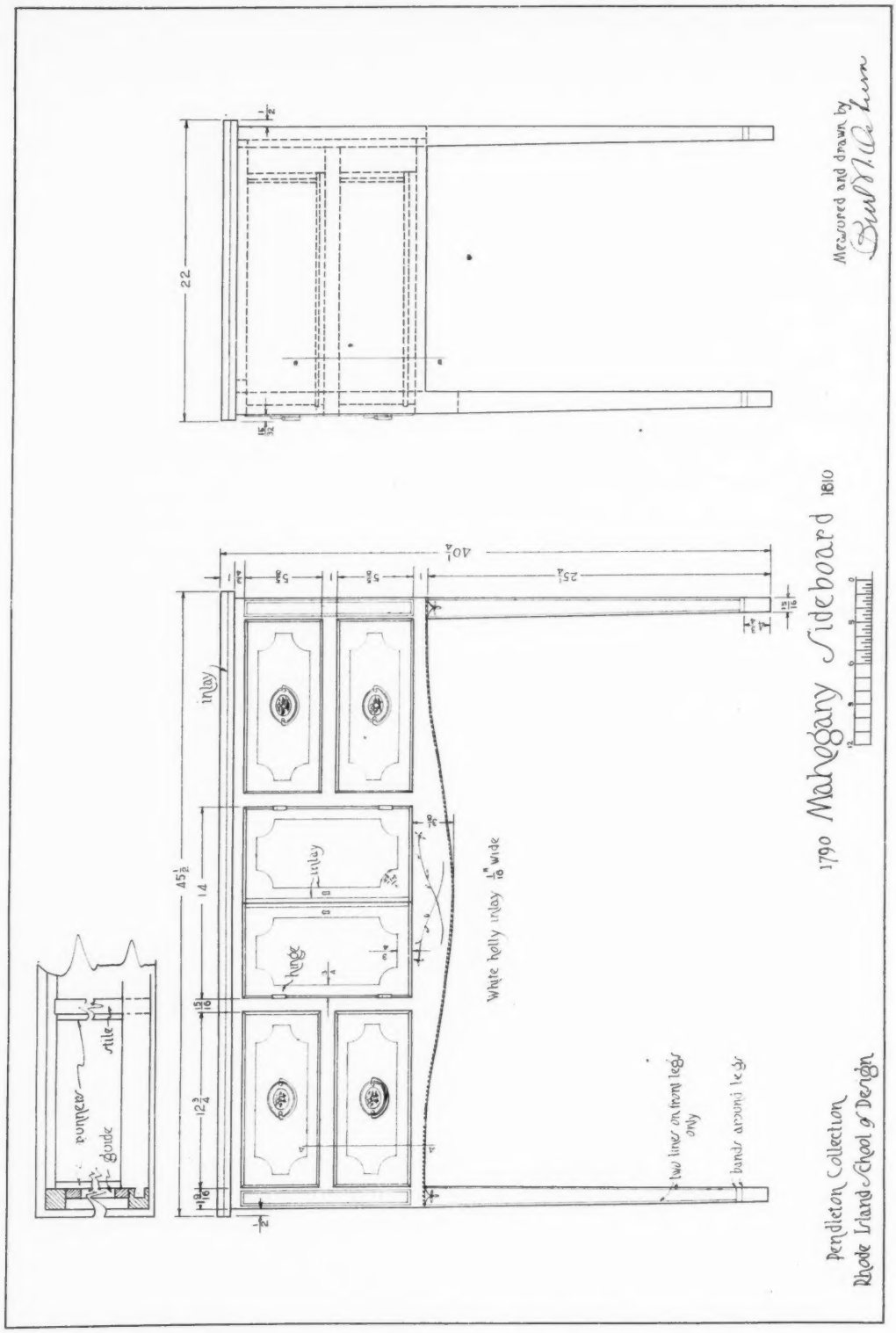
MAHOGANY "PENDLETON" SIDEBOARD

Burl N. Osburn, Sioux City, Ia.

This sideboard, in the manner of Hepplewhite, is one of the unusually fine pieces in the Pendleton collection now owned by the Rhode Island School of Design. The original is of mahogany veneer, inlaid with delicate lines of holly. Examination will show that if made of solid wood it would have no construction features greatly different from modern practice, with the possible exception of the period custom of having end and front panels flush with the legs. Drawers are made as usual, but with a rounded moulding around the face. This is also true of the two doors in the center.

The drawers are inlaid with a single band of holly placed three-quarters of an inch from the edge. The same pattern is used on the doors, with the addition of a single line on each near the line of opening. All four legs have a double band of inlay around them near the





bottom; on the front pair this extends in two lines as high as the lower rail, there it meets a three-eighths inch band of holly and mahogany. Above the rail are two lines separated by one-eighth inch of mahogany.

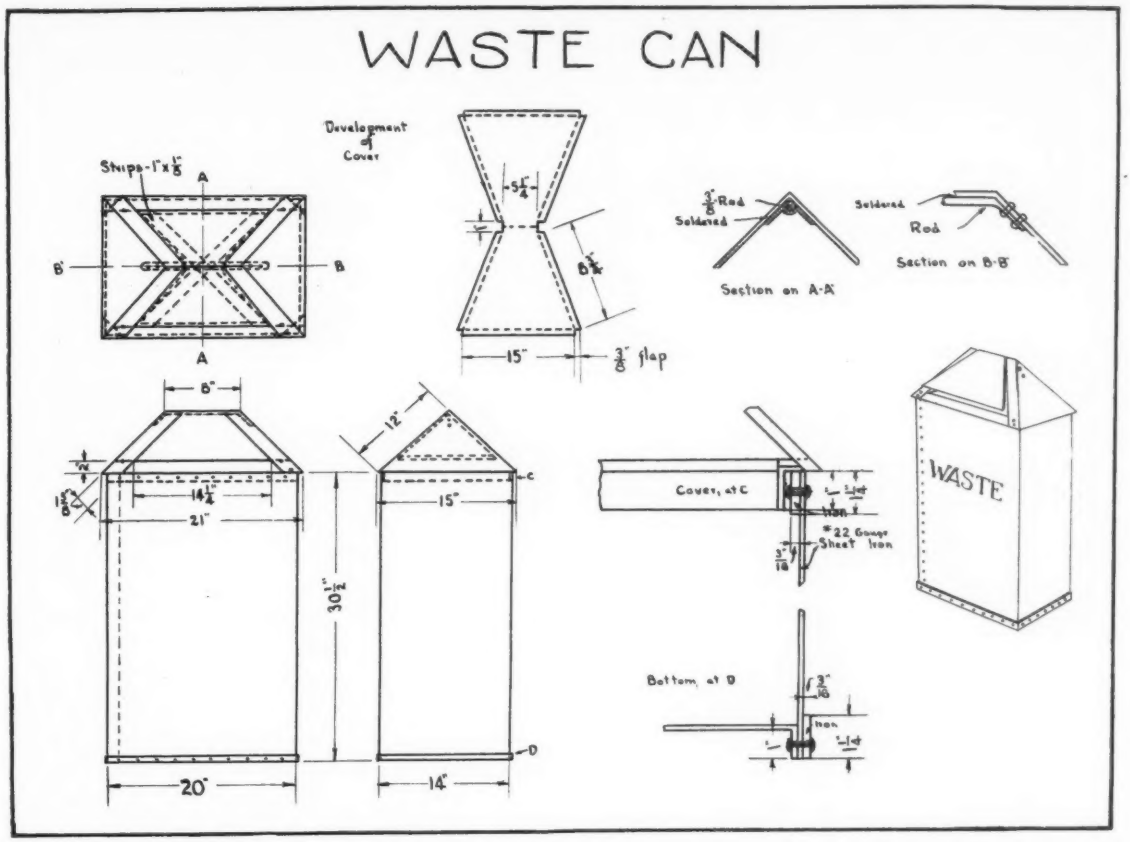
The brass plates are pressed with eagle and shield design. These may be purchased from the Wm. Ball Co., Malvern, Pa.

WASTE CAN

Herbert O. Harper, New York City

As every school shop needs a waste can, the making of one is a project of interest for the sheet metal department.

The body of the can shown is made from one piece of No. 22 gauge sheet iron 30½"x82", the two inches on the



length allowing for bending and a one-inch lap for riveting on the corner with five-pound rivets.

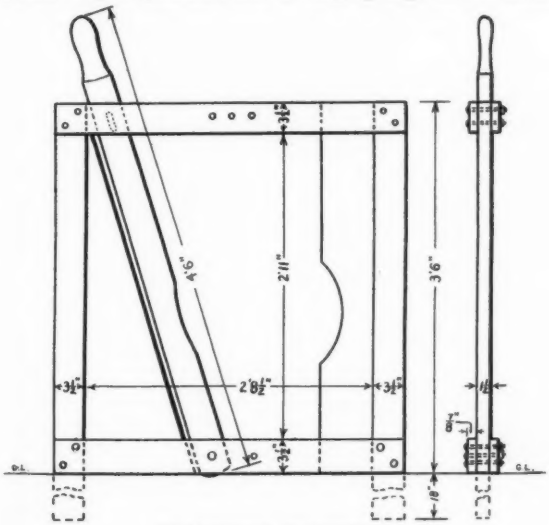
The top frame that supports the swinging cover is made of four pieces riveted together as shown. The swinging cover is held in place by the ⅜" rod which is fastened into the sides of the top frame.

The bottom is made from a sheet 22"x22", the one-inch bend preventing the bottom from resting on the floor, the weight being taken by the ⅛" band irons.

HOG-RINGING STANCHION

Victor J. Smith, Alpine, Texas

The device illustrated by the accompanying drawing has been found of material assistance in that not altogether easy or pleasant task of ringing hogs on the farm.



HOG-RINGING STANCHION.

For this reason it has been popular as a carpentry project among boys whose home contacts require that they deal with such animals.

The two uprights are set firmly into the ground at the end of a chute leading to the stanchion. The hog is easily caught and held during the ringing process, a loose bolt being inserted while the animal is being held.

The entire project can be made from a 2"x4"x16', a 1"x4"x14', two short pieces of short pieces for the triangular brace and neck catch; and sufficient bolts, screws, and nails to assemble the parts. If the fixture is to be permanent, two coats of outside paint should be applied as well as tar to the parts set into the ground.

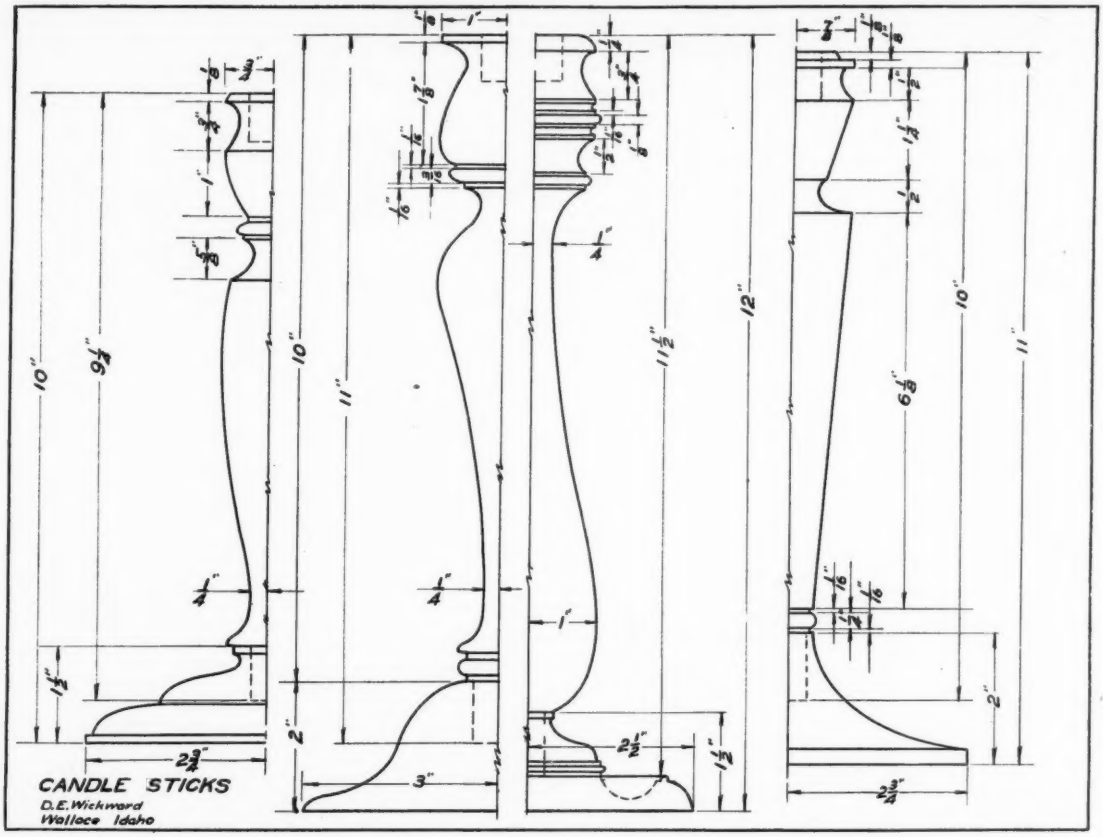
DESIGNING WOOD TURNING PROJECTS

D. F. Wickward, Wallace, Idaho

Hand wood turning as a distinct trade has almost disappeared, and we find it used only as a minor part of a few major wood working trades, such as pattern making and cabinet making in small towns. It is of use, however, in all branches of the wood industry and has considerable practical value in school shops. It affords boys the chance to break the monotony of straight line work in furniture and other cabinet making. They acquire increased skill in handling tools and an opportunity to study design, form and proportion.

The design of woodturning projects may be taught by one of two methods. First, the boys may be given stock, with directions to turn out the projects and then compare designs. Second, they may carefully design their projects on paper, compare the designs with members of the class, make needed corrections, and then turn out the projects.

The first method is unpedagogical and unpractical in this day of conservation of time and materials. It is nothing less than hit or miss, and the student who has no sense of line or arrangement of curves leaves the class in a discouraged frame of mind.


CANDLE STICKS
D.E. Wickward
Wallace Idaho

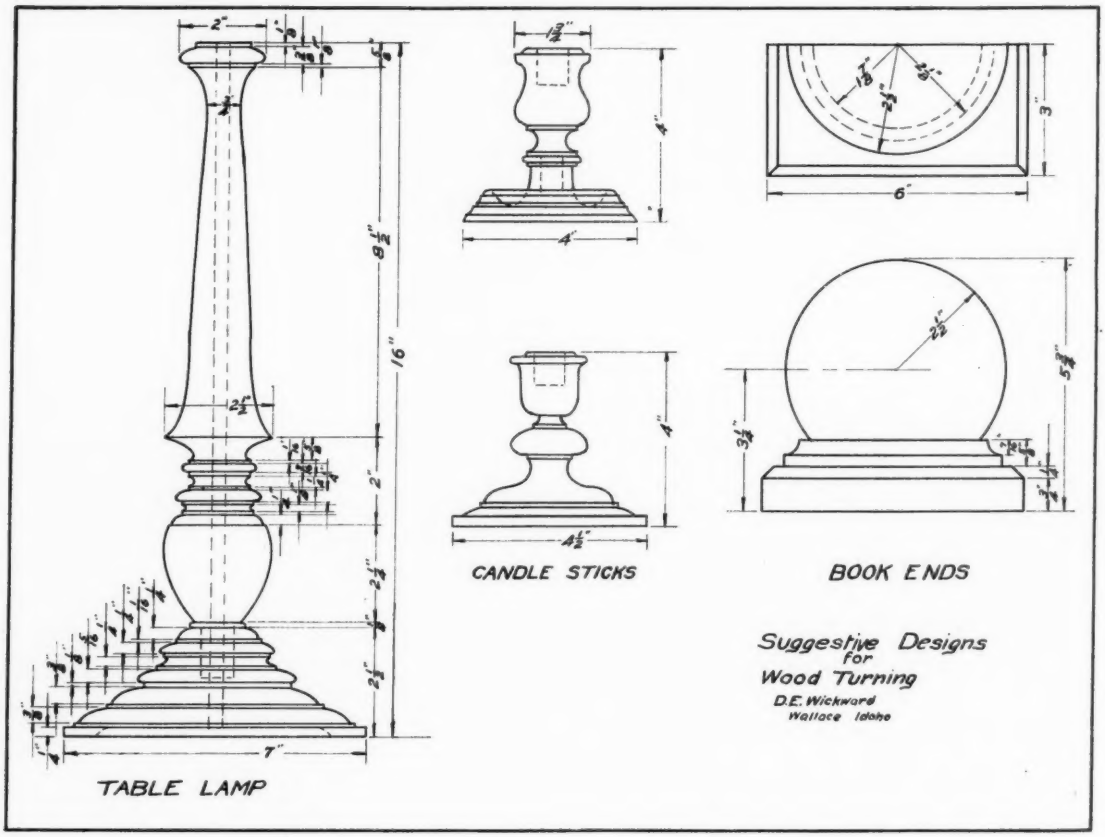


TABLE LAMP
CANDLE STICKS
BOOK ENDS
Suggestive Designs
for
Wood Turning
D.E. Wickward
Wallace Idaho

In using the only proper method of teaching wood turning designs, three things are required. First, the student must be given a definite suggestion. Second, he must be required to follow orders. Third, he must be taught that patience is the only basis of success in turning.

It is well to call the attention of boys to the fact that suggestions for designs can be obtained from objects in store windows, magazine illustrations, books on furniture, etc. If a boy has a general idea of what he desires, it is well to help him work out his ideas on paper by following definite principles like those which were suggested years ago by Mr. H. O. Grubert, formerly instructor at Stout Institute. These principles are well worth repeating:

1. In making a design block it out in the shape of rectangles and make trial sketches within these rectangles.
2. Determine, first, the predominant part.
3. The predominant part should be from four to ten times larger than the subordinate part. (This applies especially to long spindle turning.)
4. All the parts should be in proportion and harmony.
5. The whole design should convey the idea of unity.
6. The object should be pleasing to the eye and adapted to its desired use.

Any student who follows the preceding suggestions can hardly complete a good design without frequently resorting to the use of the eraser. He should not become discouraged because his arrangement of curves does not at once produce the desired results. He should rather revise his drawing until the design is entirely satisfactory and adapted to the purpose of the piece of furniture which he proposes to make. Good designs for wood turning are not drawn—they are redrawn.

MR. EDGERTON GOES TO WISCONSIN

Mr. A. H. Edgerton, who has been connected during the past scholastic year with Teachers College, Columbia University, has become head of the Department of Industrial Education and Applied Arts at the University of Wisconsin. He succeeds the late Professor Ira S. Griffith.

Professor Edgerton has had interesting experience in the field of vocational education which especially fits him

MR. A. H. EDGERTON,
Professor of Industrial Education,
University of Wisconsin, Madison, Wis.

to head the Department of Industrial Education and Applied Arts at Madison. He is a graduate of Mechanics' Institute, Rochester, N. Y., from which institution he holds a diploma in mechanical engineering and normal manual training. In 1913 he received his bachelor of science degree and Teachers College diploma in supervision at Columbia University. Four years later he received his master's degree and a diploma in administration of vocational education, and in 1924 he was given a doctor's degree for special work in vocational education.

Professor Edgerton has taught in the State Normal at Plattsburgh, N. Y., in the high school at Mount Vernon, N. Y., and at the Nassau Industrial School, Lawrence, L. I. He has been successively connected with the manual arts department of the State Normal School at Charleston, Ill., the government schools at Panama, the Lincoln School of Teachers College, the School of Education of Indiana University, and the city schools of Detroit, Michigan. He has been a frequent contributor to educational magazines and is the author of two books on industrial-arts education.

MR. WINSLOW TO BALTIMORE

Mr. Leon L. Winslow of Albany, New York, has resigned as supervisor of art and industrial arts for New York State to accept another position at Baltimore. In his new work he will act jointly as director of art in the public schools of Baltimore and as instructor in art education at the Maryland Institute. Mr. Winslow entered upon his new work on September 15th.

MR. LEON LOYAL WINSLOW,
Supervisor of Art and Industrial Arts,
Baltimore, Md.

Mr. Winslow was born in New York state and received his common school and professional training in that state. He received his diploma from Pratt Institute in 1908, and from Teachers College in 1912, and was given the degree of B. S., by Columbia University in the same year.

Mr. Winslow's teaching service was performed in the schools of Niagara Falls and New Rochelle, N. Y. In 1913 he became instructor of industrial arts in the University of Pittsburgh, and in 1914 accepted a position as director of the department at Bowling Green Normal School, Bowling Green, O. He was appointed specialist in drawing and industrial training for the New York State Education Department in 1918.

Mr. Winslow is the author of several books on industrial arts subjects and is a frequent contributor to educational periodicals treating of the industrial arts.

COMING CONVENTIONS

Manual Training Section—Wisconsin Teachers' Assn. at Milwaukee, Wis., November 6-7-8.

Maine Branch of the National Society for Vocational Education at Bangor, Me., October 30 to Nov. 1st.

Manual Training Section—Eastern Tennessee Educational Association at Knoxville, Tenn., October 31st to November 1st.

Iowa Association of Industrial and Manual Art Teachers at Des Moines, Ia., October 30-31 and Nov. 1st.

Indiana Society for Vocational Education at Indianapolis, Ind., October 16th.

Indiana State Home Economics' Association at Indianapolis, Ind., October 16th.

NOW ARE THERE ANY QUESTIONS?

Bleaching Walnut

Q. 476. I would like to secure information as to the process involved in bleaching walnut in order to secure the "French" finish. What color of stain, or filler, is used after bleaching the wood?—F. V. J.

A: Two solutions are necessary for this work and should be used in the order given:

A. Dissolve 2 oz. potassium permanganate in one pint of water. Coat the work with A. and as soon as the color has changed from purple to brown wash off with solution B.

B. Dissolve 2 oz. oxalic acid and one ounce butter antimony in one pint of water.

A sponge works very well with these materials and, if possible, rubber gloves should be worn as the solution exerts a very drying effect on the skin of the hands. Oxalic acid is a very powerful poison and hence should not be handled carelessly.

In some plants a very weak water stain is used to even up the tones produced, but it has always seemed to me that this is an unnecessary piece of work. I much prefer to size the work with a very weak solution of either white or orange shellac, depending upon the color tones desired, and when dry to sand with split 6-0 paper.

The Silex filler should be used which will match the lightest tones in the wood as the whole bleached walnut effect is a combination of gray, yellow, and tan. The filler should be allowed 48 hours to dry, should be dusted off and given a coat of high grade varnish which should be allowed to dry three to five days after which it should be sanded with a split 6-0 paper.

Dust off and give a second full bodied coat and allow one week to dry. Rub as close to the wood as possible without cutting through, using a quarter inch felt pad, FF pumice stone and crude petroleum oil. In all the walnut finishes, the final effect is to produce as little of the varnish effect as possible and where spray machines are available Pyroxylin lacquers are used with perfect results.—Ralph G. Waring.

Oregon Yew

377. Q. The Boy Scouts here are interested in archery and have tried to make bows out of hickory but these have been found not capable of making the shots required to pass the scout tests. Where can we get Oregon Yew.—M. B. M.

A: The California By-Products Co., 2067 San Bruno Ave., San Francisco, Calif., can supply this wood. Inquiries should be addressed to Mr. D. R. Smith, in charge of the archery department.

NEW BOOKS.

Industrial Physics—Heat

L. R. Smith. Cloth. 12 mo., 283 pages. Price, $2. McGraw-Hill Book Co., New York, N. Y.

This book develops an introductory study of heat and offers typical examples of its application to industrial (mechanical) uses. Its purpose is to provide a background for students of mechanics and to give them an understanding of operation of steam boilers, steam engines, internal combustion engines, from the standpoint of physics. The book is of interest to all students of mechanics and affords excellent material for lectures and assigned readings in apprentice and other vocational classes.

Simple Architectural Letters

Jonathan Bright and J. F. Faber. Paper, 64 pages. Price, 35 cents. Bruce Publishing Co., Milwaukee, Wis.

This book forms a complete course in architectural lettering in handy, self-teaching form. Each page provides "copy" for progressive problems and space for practice.

Household Physics

By W. G. Whitman. Cloth, 12 mo., 437 pages. Price, $1.90. John Wiley & Sons, New York, N. Y.

This book is of the practical, applied type and emphasizes the social as well as economic values of all the principles of physics which are described and discussed. It takes up very broadly the entire range of materials, processes, devices, appliances, machines, etc., used in and about the home and explains these in terms of the laws of physics.

Shop Arithmetic

By Earle B. Norris, M.E., and Kenneth G. Smith, A.B., B.S., 2nd edition. Cloth. 257 pages. illustrated. Price, $2. McGraw-Hill Book Co., New York.

This book has been developed from the experience of the authors as instructors of the mail extension course of the University of Wisconsin. The students are shop men largely in the metal working trades, and the work is entirely intended to meet their needs, desires, and abilities. Common fractions are taken up in the first chapter and from this elementary beginning the work progresses through the more difficult application of arithmetical principles and methods to mechanics and machine shop work. The final chapters are devoted to logarithms and the use of the slide rule.

Textile Assignments for Vocational and Trade Schools for Girls

Prepared by the Teachers in the Manhattan Trade School for Girls. Paper, 26 pages. Price, $0.75. A. S. Barnes & Co., New York, N. Y.

A series of lessons on textiles developed according to the Dalton plan.

Sunbury General Shop Accomplishment Test

By W. E. Steiner and W. A. Geesey. 8 pages. Price, $0.05. Published by the authors at Sunbury, Pa.

This standard test contains one hundred problems in school shop work and is intended to test the knowledge, experience, and mechanical skill of boys in the 8th and 9th grades. It is of the popular "right and wrong" type and affords a broad view of a boy's familiarity with the materials, the methods, the terms, and the processes used in the general school shop.

The following questions will give a clue to the general character of the work:

"6. Rough lumber is called (1) stock, (2) boards, (3) scantling, (4) timber.

"36. In cutting sheet metal use (1) scissors, (2) snips, (3) pliers, (4) stakes.

"69. A full font of type contains most (1) a's, (2) t's, (3) e's.

"83. A drill press is used in (1) sharpening tools, (2) drilling steel, (3) threading nuts, (4) trueing a surface.

"97. Traps in sewer pipes are required (1) to prevent sewer gas from entering room, (2) cause water to flow more freely, (3) as an ornament, (4) as an aid in cleaning the sewing pipe."

The tests are supplied with answer sheets for the use of the teacher.

Woodworking Machinery

William Noyes. Cloth, octavo, 144 pages. Price, $3.00. Manual Arts Press, Peoria, Illinois.

This book fills a real need. It provides in easily accessible and usable form an explanation of the construction, mechanical principles, and operation of the leading types of machinery used in woodworking. It affords just the information which the student, the apprentice, and the novice want to arrive at an understanding of, the why and how of the machines he is called upon to use. Much useful information concerning speeds, capacities, and special uses of machines is provided.

Automotive Electricity—IV

B. B. Burling and R. H. Grambsch. Loose leaf, 104 pages. Price, $1.44. The Bruce Publishing Co., Milwaukee, Wis.

This book completes the Burling series of automotive electrical manuals and takes up definitely 37 of the leading starting and generating systems. The lessons are arranged to give the student, first, a complete description of the mechanical and electrical construction of the several systems, and second, complete directions of making inspections, adjustments, and tests. The book is in reality a complete shop manual which the repair man can use as a guide for trouble shooting, repairing, and rebuilding the leading types of starters and generators. The illustrations are complete and cover not only the various instruments, but include wiring diagrams.

Projects in Furniture Making

F. A. Adams. Cloth, royal octavo. Ninety-five pages. Price, $1.45. The Bruce Publishing Co., Milwaukee, Wis.

This book offers a series of working drawings for making simple furniture—all carefully taken from successful pieces made in the author's experience as a teacher and easily within the ability of average boys. The collection is mostly straight-line, without constructional difficulties, and of a character suited to use in the middle class and poorer homes. The groups include stools and ottomans, tables, desks, chairs, bookcases, dressing tables, and miscellaneous pieces. The descriptive notes are brief but ample to indicate construction, etc., not readily understood from the plates.

Press Work Lessons

Six pamphlets on the Miehle Vertical Press. Issued by the Department of Publishing and Printing of the Carnegie Institute of Technology, Pittsburgh, Pa.

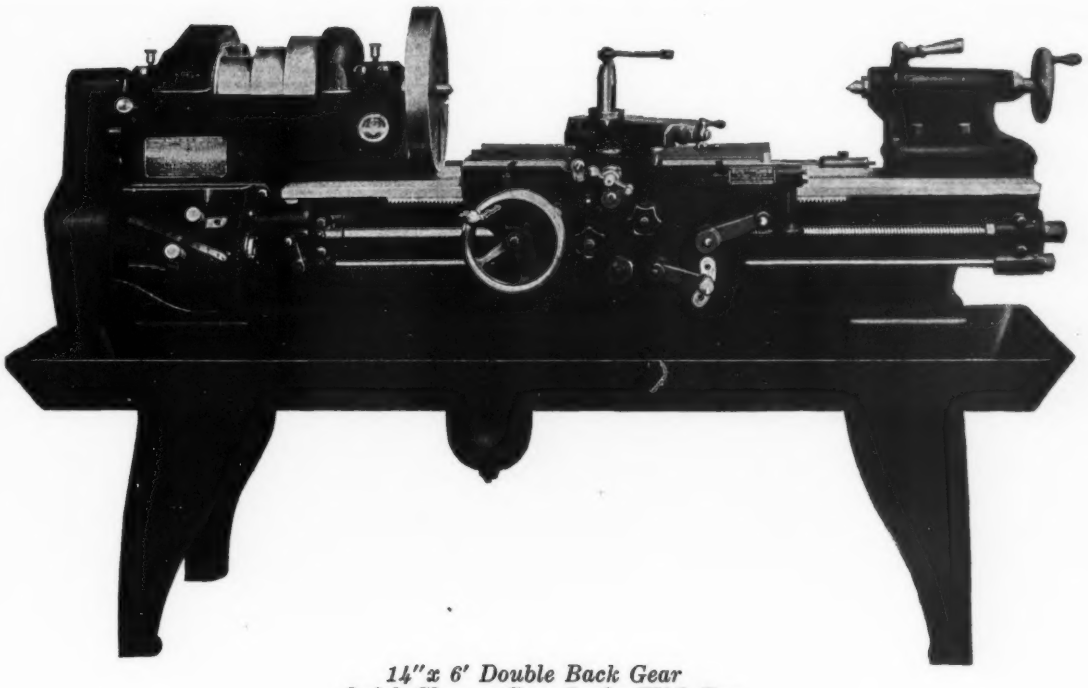
These lessons in elementary presswork are intended to acquaint beginners with the characteristics and operation of vertical presses, particularly the new Miehle vertical press. A list of the lessons indicates the comprehensive treatment of the subject:

1. Characteristics of the vertical press.
2. Mechanical devices and special features.
3. Variety and quality of work.
4. Operation and care of the press and feeder.
5. Make-ready and running various jobs.
6. Helpful hints for pressmen (trouble shooting, kinks, etc.).

The lessons are comprehensive in explaining the mechanical principles applied in the feeder, in the sheet control, in the delivery, etc., so that the pressman may know exactly why as well as how to operate and care for the press. The lessons follow the analytical form of arrangement adopted in the Typothetae's course in printing and are detailed to the point that they are actually self-instructing. The final lesson anticipates every possible type of trouble and suggests the correct method of eliminating it by calling attention to the causes and directing the pressman to the correct method of operating the part of the mechanism involved. Many useful "kinks" are included in the lessons.

Copies of the lesson sheets can be had not only from the Carnegie Institute but also free of charge from the Miehle Printing Press & Mfg. Co., 14th and Robey Streets, Chicago, Ill.

An Introduction to Safety Education. Introductory Chapter by Harold Rugg. Prepared by The Education Section of the National Safety Council. Paper, 99 pages. National Safety Council, Chicago, Ill. This is a teachers' manual and will be found useful in developing the safety element in grade and high schools.



14"x 6' Double Back Gear
Quick Change Gear Lathe With Pan

MORE Monarch Lathes are being used in manufacturing plants throughout the country than any other make. More Monarch Lathes are being installed in Manual Training Departments of schools than any other make of lathe. The student, upon completion of his school work, will find himself coming in contact with Monarch Lathes in most shops.

Monarch Lathes are built in sizes ranging from 9 inch to 30 inch swing, and bed lengths from 2½′ to 30′.

Our Engineering Department will gladly submit plans and layouts for machine shop installations and we are in position to give Vocational Instructors valuable information and plans, for which no charge is made.

There is a Monarch Dealer near you, who will gladly show you the merits of Monarch Lathes.

We have prepared a series of lantern slides illustrating the most modern manufacturing methods used in the production of an engine lathe and these slides will be loaned to any Vocational Instructor upon request.

Let us send you Special Vocational Bulletin.

THE MONARCH MACHINE TOOL CO.

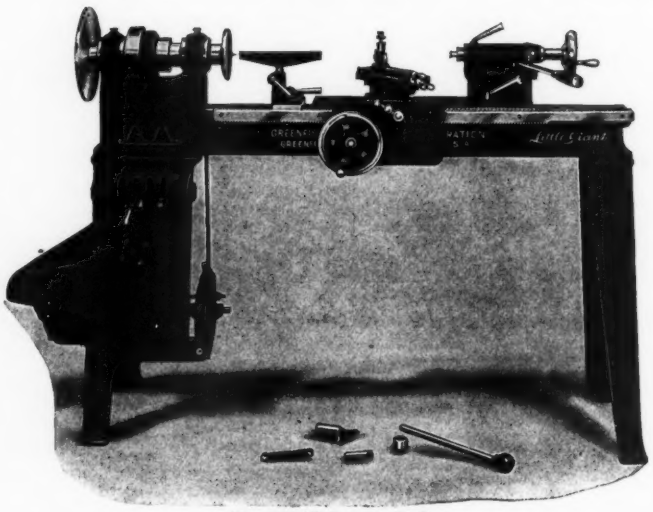
304 OAK STREET **SIDNEY, OHIO**

Largest builders of high grade engine lathes and specialists in lathes for Vocational Training.

START THEM RIGHT!

This is the season when many pupils will get their first experience with machinery. Is your school shop properly equipped with lathes to start them off right?

If GTD wood working lathes are not part of your equipment you are not giving the youngsters the advantage of the newest development in lathe construction and safety appliances. Write us for bulletin No. 104 for particulars.



No. 218 All-Purpose Lathe.

GREENFIELD TAP AND DIE CORPORATION
GREENFIELD, MASSACHUSETTS

School Representatives
R. A. FIFE CORPORATION, Mamaroneck, New York

NEWS AND NOTES FROM THE FIELD

Agricultural Department. A department of agriculture has been established in the schools of Moorhead, Minn., with Mr. C. M. Gillis in charge.

Train Workers for Trades. The shortage in skilled labor in Los Angeles industries is being overcome by classes in more than a score of trades being conducted under the direction of the board of education. Among the trades taught are brick-laying, plastering, power-machine operation, and machine shop work. During the last year, 432 students were graduated from the trade preparatory school; this summer there are 71 undergoing training. The students range in age from 21 to 45 years.

Thousands take Vocational Work. More than 20,000 boys, girls, men and women in Washington have taken advantage of vocational training opportunities in the last six years, according to W. H. Hummel, state director of vocational education. During the past year, 70 day and night schools have been maintained, a part of the cost being paid from federal funds.

Vocational Leaders Assist in New Course. A committee of Indiana educators has recently been appointed to assist Purdue University at Lafayette, in the organization and administration of its new course in industrial education. Those chosen to serve on the committee are Mr. F. S. Barrows, Hammond; Mr. A. L. Shank, Mishawaka; Mr. G. E. Wulfing, Gary, and Mr. G. F. Weber, South Bend. Another committee to make recommendations on a cooperative course has been named as follows: Mr. H. W. Roberts, Anderson; Mr. G. B. Brown, Muncie, and Mr. H. G. McComb, Indianapolis.

Wisconsin Agricultural Conference. The Wisconsin Conference of Vocational Agricultural instructors was held at the Oshkosh high school, Oshkosh, Wis., on August 4th. Between fifty and sixty teachers from all sections of the state were in attendance. The principal topic for discussion was Smith-Hughes standards for vocational education.

Stout Loses Title to Residence. The Wisconsin vocational board has lost title to the old Stout homestead, at Menomonie, which had been deeded to Stout two years ago, on the condition that the property be improved and used for dormitory purposes within a two-year period. The legislature failed to appropriate the necessary funds for the work and the time limit having expired, the heirs took possession of the property.

Install New Equipment. A shipment of heavy machinery for school shop use has recently been installed in the manual training department at Eaton Rapids, Mich. The equipment comprises a jointer, a saw bench, a sander and a tool grinder, all operated by electric power. Mr. Hubert Howe has been appointed as instructor for the next year.

Household Arts Course. At Northampton, Mass., a plan for a household arts course for high school girls has been adopted, one-half to be studied in the high school, and one-half at Smith's agricultural school. The number of pupils eligible for the course is limited to twenty and the Smith school has agreed to pay transportation costs one way. The minimum requirement in the high school is eighteen recitations a week, with five recitations in the required subject of English and the remainder in electives such as history, science or some other study. The nine recitations at the Smith school are to be elected from a program including the subjects of clothing, food, health, household science, household management and art. Successful completion of the joint course entitles the student to a high school diploma.

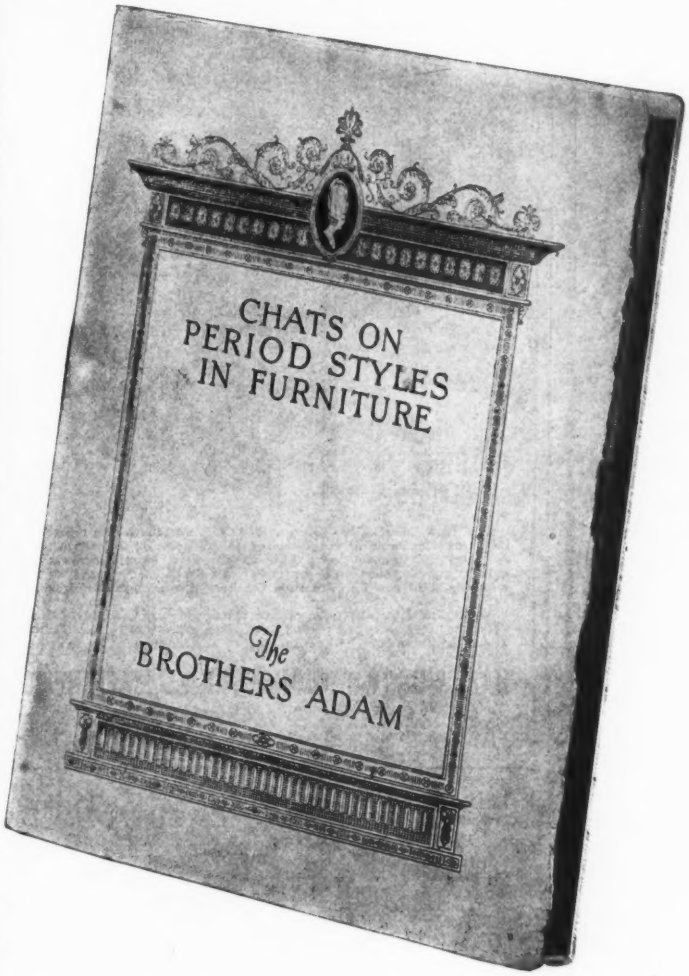
Extend Continuation Schools. In line with a recommendation of the State Education Department, the committee having in charge the preparation of the New York City school budget, has recently voted to authorize the establishment of four additional schools next year. These schools will be centrally located and will specialize in various vocational activities.

The committee also included provisions for doubling the number of students to be taken care of in the continuation schools. The added expense of the new arrangement has not been ascertained up to the present time.

Under the plan, three of the new schools will be for commercial, academic and trade students. The fourth school will take up the building trades and will be conducted in cooperation with the advisory board on industrial education.

It is the purpose of the board to provide facilities for 70,000 students in all the schools by the end of 1925.

(Continued on Page 25a)



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and the furniture and architecture to which their name belongs.

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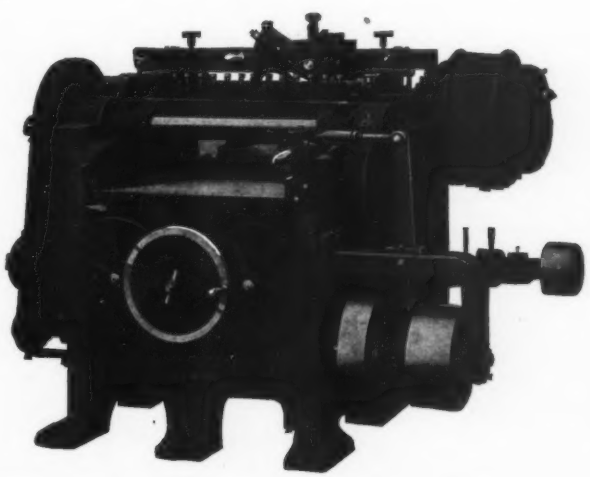
To all others a charge of twenty-five cents per copy to cover the cost of printing and mailing will be made and that amount in stamps or coin should be enclosed with request for copy.



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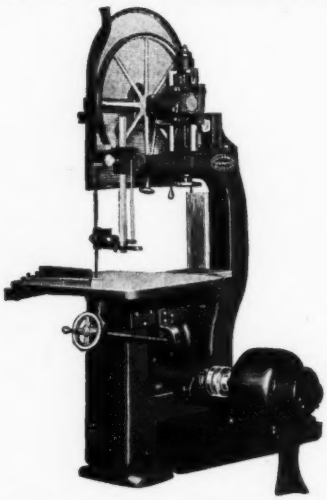

The New Model No. 185 and No. 186 Bandsaws represent the latest development in machines of this type. Built in two sizes, 30" and 36" wheels, with ball bearings or babbitted bearings, safety guards that are designed and built as a part of the machine, and can be furnished for belt or direct motor drive.

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Tilting Arbor Saw Bench "J-S"

Tilting arbor with 5 h.p. 60 cycle motor wound directly on the arbor and running on ball bearings eliminates all belts, babbitt bearings, countershaft, loose pulleys. Table always level and same height from floor. Machine clear on all sides. No danger of work sliding against saw and being thrown. Left section of the table slides on 10 ball bearing rollers. Will expand to take dado heads as wide as 4". Motor controlled by push button switch on the front edge of the table. "Protect the boys."

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STANLEY Planes

Stanley Bailey Plane No. 5¼, accepted by School Authorities as the standard for Manual Training Work

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NEW BRITAIN, CONN. U.S.A.
THE STANLEY WORKS – THE STANLEY RULE & LEVEL PLANT

(Continued from Page 22a)

There were 35,000 pupils in continuation schools in June last, and 10,000 more are expected in September. It is probable that 300 additional teachers will be needed to take charge of these additional students. At least 126 teachers will be assigned this fall.

Begin Third Vocational Unit. Construction work has been begun on the third unit of the vocational school at Milwaukee, Wis.

Continue Training School. Upon recommendation of the superintendent, the Boston school committee has ordered that the training school for teachers of the mechanic arts be continued. The school will hereafter be conducted in connection with the manual arts department.

Revise Rules for Certificates. The Boston school committee has revised its rules governing special certificates in mechanic arts. Under the rules, applicants for the special certificate must be graduates of a high school or its equivalent, must have had at least two years of supplementary education, three years of successful teaching experience, and two years of trade experience.

Revise Courses. Upon recommendation of the superintendent, the Boston school committee has amended the courses for boys and girls of the continuation schools. For the boys' division, the following courses are offered: Lettering and sign painting, telegraphy, picture framing, elements of advertising. For the girls, the courses are as follows: Embroidery, crocheting and knitting, bead work, novelty work, and basketry.

Conference of Agricultural Instructors. The topic, "Standards of Vocational Work in Wisconsin High Schools" was the subject of discussion at the opening session of the Annual Conference of Vocational Agricultural Instructors, held August 4th, at Oshkosh, Wis. Among the speakers who led in the discussions were L. M. Sasman, state director of vocational agriculture, who spoke on "Smith Hughes Standards"; V. E. Kivlin, Portage, who talked on "Farm Mechanics; W. C. Christiansen, Chippewa Falls, who talked on "Supervised Farm Practice"; L. A. Linke, Washington, D. C., who talked on "Scoring Departments in Vocational Agriculture," and George P. Hambrecht, Madison, who gave an outline of the work accomplished in Wisconsin.

National Picture Week. The observance of National Picture Week, the feast of pictures, will be celebrated October 13th to 23rd. The celebration of picture week is under the auspices of the American Art Bureau, an organization devoted to promotion of art in the school and the home. The association has done much to tell the public of the great variety of excellent reproductions of classic and modern paintings which are available at reasonable prices and to indicate to home furnishers the place that good pictures occupy in homes expressing beauty and culture.

The bureau offers the following suggestions for observing the feast of pictures:

1. Select one fine picture each day of the week for study. Look up material on the artist, his time and country, the location of the original of the painting.
2. List the fine pictures in the school. Study and discuss them.
3. Select a well-known American artist for study for the week.
4. Have a picture exhibit in each room, or in the school. Call on the local women's clubs for help and ask the local picture dealers to loan framed pictures or to permit exhibits in their stores.
5. Visit picture galleries or view library collections of prints. Find interesting modern pictures among the reproductions, as well as the familiar masterpieces.
6. Arrange to have one framed picture presented to the school, or to each classroom, through the efforts of the pupils.
7. Dramatize masterpieces by arranging figure groups to resemble originals. This is good for an entire school to work on.
8. Have written papers and discussions about pictures and their use as a part of home furnishing, pictures in books, in schools, the home, art galleries, and in hospitals, clubs and other public buildings.
9. Study the different kinds of print processes; etchigs, lithographs, block prints, monotypes, aquatints, mezzotints and others.
10. Conduct memory exercises and games in recognizing pictures.
11. Permit children to choose their favorite picture from several shown them, and explain why chosen.

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Instructions For Making Blue Prints is complete and shows how to make blue prints on our special school Blue Printing equipment, step by step.

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12. Allow domestic science classes in home furnishing to show pictures setting the color note of a room, with draperies and other furnishings harmonizing.

Construct Electrical Pieces. Some useful pieces of electrical apparatus, as well as toys, were made by the high school boys of Pittsburg, Kans., during the past term. One boy constructed a 350-watt power transformer for a radio transmitting set, supplying ten volts for the filament circuit and 1,000 volts for the plate. Another pupil built an audio-frequency transformer for a receiving set. A third made a complete telegraph set, including the transformer, buzzer, key, and switch. A 150-watt, multiple voltage transformer, an electric toaster, a battery charger and a toy motor were other pieces turned out by the pupils. A large number and variety of projects, suitable for construction in the school shop, are offered from which the boys choose those they wish to make. They also have the privilege of purchasing the projects they make if they so desire.

Conference of Vocational Directors. The second annual conference of vocational directors of Indiana was held August 1st and 2nd, at Purdue University, LaFayette, Ind. The program included an address by President E. C. Elliott and two addresses by J. C. Wright. Discussions of vocational topics were conducted by Prof. O. H. Day of Purdue; Prof. Geo. L. Roberts, Denman Kelley of the State Normal School; G. E. Wulfing of South Bend, Geo. F. Buxton of Purdue, F. S. Barrows of Hammond, H. W. Roberts of Anderson, H. G. McComb of Indianapolis, and J. J. O'Brien of South Bend. Mr. Z. M. Smith acted as toastmaster at the dinner conference held in the Hotel Fowler.

Apprentice Training at Niagara Falls. "Niagara Falls is a city of 60,000 inhabitants and the home of many specialized industries," says a bulletin issued by the University of New York. "Organized agencies to prepare apprentices to meet the existing demands of the city, or even to provide for the mortality in the trades, have not existed."

The employers admit that they have employed so-called learners; but that the number of skilled laborers has been short and that some concerted effort in the direction of apprentice training must be adopted.

The state law provides for so-called vocational advisory boards to serve in connection with the regular board of education. The building trades of Niagara Falls have proceeded under this law and the following trades are represented:

Carpentry, bricklaying and stone masonry, sheet metal working, painting and decorating, plumbing, plastering, electrical work, planing mill work. A complete plan as to studies, hours, wages, has been worked out.

New Vocational School. Plans have recently been approved for the Boys' Vocational School to be erected for Essex County at Irvington, N. J. The building will be a three-story structure of red brick and Indiana limestone. It will contain in addition to classrooms, shops, offices, gymnasium, assembly room and medical inspection rooms, and will cost about $200,000. Wings to the east and west of the structure may be built later to increase the capacity of the building. Construction work will begin this summer and the building will be ready for occupancy in September, 1925.

New England Conference. The annual summer conference of the New England Vocational Guidance Association was held July 21st, at the Harvard Summer School, Boston. Miss Susan Ginn, president of the organization, presided at the sessions. Addresses were given by Prof. E. A. Lee of the University of California; Dr. Walter Van Dyke Bingham, of the Carnegie Institute of Pittsburgh; Dr. J. E. Burke, superintendent of schools of Boston, and Dr. John M. Brewer of Harvard University.

An Apprenticeship Survey. A survey covering 65 American cities on the apprenticeship status in the steamfitters' trade was recently made. It has been known that there had been a steady decrease in the number and the efficiency of journeymen in this branch of industry; but the exact status had not been established. The survey was made by the Heating and Piping Contractors' Association.

It shows that only five out of 65 cities have an apprentice system. All except twenty cities are unionized. The wage runs from $1 to $1.31 per hour, and eight-hour day prevailing in all cities. In fifteen cities the supply of men is scare, in twenty it is plentiful.

The National Trade Extension Bureau urges the following points in stimulating vocational training:

(Continued on Page 29a)

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for simple or ambitious color relief work

School art instructors everywhere are realizing more and more that nothing is better suited to the special needs of school art work than our wonderful paint for producing low relief effects.

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For this reason we recommend that you write for our booklet on "Prang Reliefo," whereupon you will learn in complete detail what it is, and how it is used.

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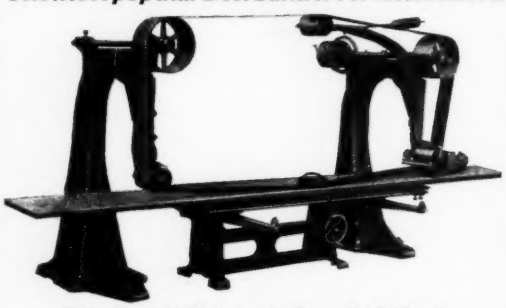

This No. 134 Universal, Open-End Hand Block Belt Sander handles an almost unlimited range of work; flat and curved pieces, built up cases, mouldings, edges, etc. The standards set close together and over-reach, leaving the ends open for sanding exceptionally long work. Belt may be elevated from table level up to 5 feet from floor.

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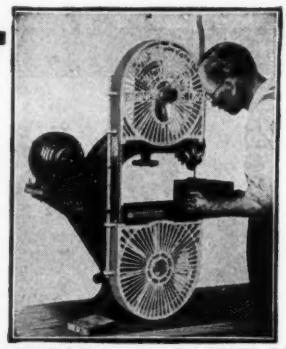

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SYRACUSE 15″ Disc Sander and Grinder is the pioneer of all dustless machines. It has proven by its years of universal service that it is the standard for performance and dependability. Designed for the accurate sanding of a variety of work, it is a necessity in the school. A large majority of the pattern shops use SYRACUSE Sanders. Why not instruct your pupils on the machine they will eventually use?

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Designed to fill the demand for a Band Saw of dependability, high quality, yet compact and portable, this machine has met with unqualified approval in schools and shops. Ask users what they think about the SYRACUSE Band Saw.

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MANUFACTURERS ALSO OF TOOL ROOM LATHES, MILLING ATTACHMENTS, BELT AND SPINDLE SANDERS AND GRINDERS

We would like to tell you more about them

THE PORTER-CABLE MACHINE CO. — SYRACUSE, N.Y.

(Continued from Page 26a)

First, to pay a fair wage. Second, to give the opportunity to learn the whole trade. Third, to guarantee the technical training in skill and knowledge. Fourth, to guarantee continuous employment during apprenticeship, so far as possible. Fifth, to give the apprentice a "square deal," and require it of him in turn.

It will be necessary in order to teach apprentices to prepare a course of study or a textbook. The only way that this can be done effectively is to analyze the trade, and from this material to select the skill and the knowledge that the apprentice should acquire.

But preparation of the textbook is only one step in solving your situation. It will be necessary for you to secure the cooperation of community forces in each city in which training is to be given. School authorities must be informed of your plans. A campaign of publicity should be conducted throughout the trade so that existing facilities may be used by those who desire to train apprentices. This work cannot be done unless you make it the exclusive responsibility of some one person. What is everybody's business is nobody's business.

The Kamehameha School, at Honolulu, is the first institution in Hawaii to introduce part-time vocational training. "Earn while you learn," is the slogan. In its first year at Kam this system will affect only the senior class. Next year the seniors will be divided into two groups. While the first group is out working on some practical, well-chosen job that will supplement the knowledge the students are gaining in their academic work, the second group will be in their regular school work. At the end of each two weeks' period the groups will alternate so that every boy will be dividing his time equally between school and outside work. The senior high school course will be lengthened one year so that the academic work will not suffer in any way.

An Indianapolis, Ind., banker in a public address, sees "the threatening absorption of our schools in an encroaching vocationalism." The speaker declared that business needs youth educated vocationally in those things that make for the energizing of body, soul and mind. He added that "in this plea I would not seem indifferent to vocational training that is a supplement and not a substitute. It is the substitution that is challenged."

Extend Continuation Schools. The board of education of New York City has opened four more schools for juvenile industrial workers and has made plans for the employment of 279 additional teachers, beginning with the new school year. It is estimated that the total enrollment in continuation schools for the next year will reach 70,000, or an increase of about 35,000 over last year.

Of the four new schools, one will be a general academic and trade school for the Jamaica district; another will be an academic and trade school for the Brooklyn district, while the Manhattan district will be given both a printing and building trade school, and a business school.

New School Shop. The school board of Kansas City, Mo., has erected a manual training shop at the rear of the Woodland School, at a cost of $9,000. The present shop will be remodeled to provide two additional classrooms.

Add Carpentry and Plumbing Courses. The committee on education, of the board of trustees, at the Paterson Vocational School, Paterson, N. J., has approved the addition of day courses in carpentry and plumbing. Mr. Andrew Carson will be instructor in carpentry, and Mr. Joseph Ackerman, instructor in plumbing.

Steel Shop Building. A steel shop building, one story in height, has been erected at Rock Springs, Wyo., to house the high school classes in electrical work, machine shop practice, forging, auto-mechanics and woodwork. The walls and roof of the building are of copper bearing steel and the foundation is of concrete.

Equip Shops. Rooms equipped for industrial and agricultural courses for the boys and home-making courses for the girls are included in the extension to the Weymouth high school at East Weymouth, Mass.

Vocational Boys Perform Task for City. The students of the Vocational School at Grand Rapids, Mich., have aided the service decorator in the decorating of the main entrance to the city filtration plant. The students modeled three plaques, from which copper reproductions were made to hang at the doorway of the plant. One plaque represents the official city seal, while the other two are representations of the zodiac marks symbolic of water.

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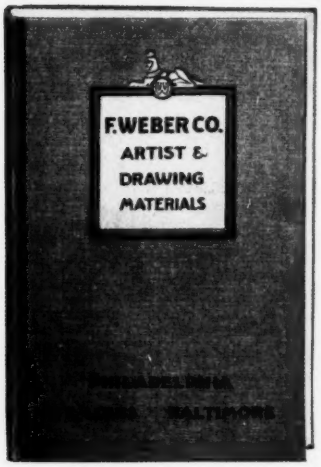
Engineers

Draftsmen

Instructors



All Make It Their Buying Guide

And what a sensible plan, buying through the Weber Catalog, has proved to be. Everywhere, users of drawing materials are saving themselves time and money by turning to its pages whenever they need supplies. Past performance and durability have proved to them the absolute reliability of buying through the Weber Catalog. And they have a definite assurance that here they will find the exact instrument they require.

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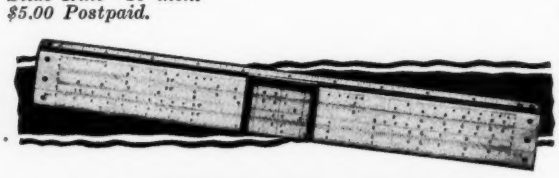
No. 4288, Page 237
Sphinx Maniphase
Slide Rule—10 inch.
$5.00 Postpaid.



WEBER
Cataloged Drawing Materials

Vocational Education Costs in New York City. The hugeness of the New York City school system is made apparent through the annual budget which has just been completed for the year 1924. This budget, as voted by the board of education, calls for total appropriations of $100,711,933 of which about eighty-five per cent is to be used for instructional purposes and about fifteen per cent for supplies and repairs. The immensity of the expenditures for vocational and industrial-arts education becomes apparent from the following partial list of activities:

Sewing	$ 189,361
Drawing	139,957
Cooking	856,211
Vocational bureau	19,930
Vocational and trade schools	656,390
Prevocational	331,331
Industrial classes in elementary schools	118,732
Shop work	840,757
Evening trade schools	245,952
Compulsory continuation schools	1,077,237

The foregoing involve no amounts for supplies and replacements for which separate appropriations are made.

Long Beach Part-Time School. Long Beach, California, has erected the first unit of its part-time high school as a means of replacing its outgrown quarters. In a made-over cottage, adapted for school uses, are held a wide variety of classes and weekly club meetings.

Denver School Offers Courses. A course for household assistants is being offered in the Denver Opportunity School at Denver, Colo. It is an intensive course of eight weeks covering five hours daily classwork. The Opportunity School was attended by nine hundred persons last year. A wide variety of courses is offered and the students come at hours which they can best spare from their work.

Mr. William M. Alberg has been elected instructor in manual training in the Penn School, Chicago, Ill. Mr. Alberg recently completed the probationary period of four months.

Trade Publications Issued. The Division of Vocational Education, University of California, has issued a series of publications dealing with the analysis of certain trades which should prove of interest to those engaged in teaching these trades. Bulletin No. 12, March, 1923, is entitled "An Analysis of the House Carpenter's Trade"; Bulletin No. 13, September, 1923, is "An Analysis of the Cabinet-Maker's Trade," and Bulletin No. 15, April 1924, is "An Analysis of the Plasterer's Trade."

A Study of Pre-vocational Schools. A special committee on pre-vocational schools has recently presented to the Milwaukee (Wis.) school board the results of a study of pre-vocational schools. According to the committee there are several types of pupils whose peculiar needs are not well served by the usual kind of school work. Among the types of boys and girls in this class are:

1. Those out of step with the work of the regular school, either as a result of a natural distaste for school work or for other causes.

2. Those who are considerably over age and often physically developed to an unusual degree considering the stage of their school progress.

3. Those whose active nature incline them to breaches of discipline.

4. Those who are often spoken of as more inclined to physical activity than to academic effort.

5. Those whose home environments are such as to afford them only a limited outlook upon life, giving them insufficient training in habits and duties of citizenship.

6. Those whose inclination and intent is to leave school early to enter the employment field.

7. Those of foreign birth, or of parents of foreign birth who have not had the advantages of an English mother tongue.

Free Trade Schools Opened. Three additional free trade schools have been opened at San Francisco, Calif., by the San Francisco Industrial Arts Association. The new schools will teach iron and brass moulding, brick laying, painting and paper hanging and are operated along the same general lines as the plastering and plumbing schools previously established. The schools have been pronounced successful by the trades inasmuch as they have turned out acceptable graduates and have thus met a serious shortage of skilled workmen.

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Superintendents of schools and principals are urged to request further information about Printing–the Modern Educational Tool. Write to

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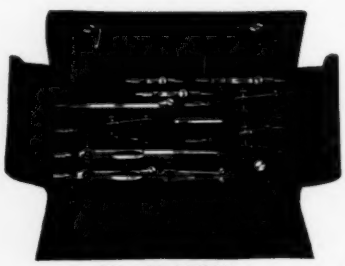

No. 630 PRIMO

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PUBLICATIONS RECEIVED

Oak Flooring: How and Where to Use it. Fifteen pages. Twenty-third edition. Issued by the Oak Flooring Co., 1014 Ashland Blk., Chicago, Ill. This booklet has been issued with the idea of giving practical advice for the handling, laying, finishing and care of oak floors. Each detail has been carefully considered so that it may be easily understood by the layman and professional builder alike. The booklet offers a list of grading rules for the sawing of the different species of wood, lists the standard weights and counts of oak flooring, and tells how to estimate the amount of flooring required for the purpose intended. The final section deals with the care of the floors after they have been laid, and also how to treat floors which have become badly worn.

Copies of the booklet are available for school shop instructors who address the firm at Chicago, Ill.

Projects for Machine Shop Courses. The South Bend Lathe Company is supplementing its earlier splendid educational service to instructors of machine shop practice by a new line of projects and problems. It has just prepared and is offering at cost three series of blue prints involving 79 projects ranging from a small nail set, which a beginner can make, up to a complete 3½ h. p. marine gas engine which only a student, who is ready to go out as a journeyman, can undertake. Each set of blue prints has attached to it a complete outline of operations so that the student will understand exactly where to begin, in what sequence to handle the several operations, how to test work, and how to finally complete it. Any reader of the **Industrial-Arts Magazine** may obtain a complete list of the projects by addressing the South Bend Lathe Works, and mentioning the magazine.

PERSONAL NEWS

Mr. L. A. Kemmerer of Catasauqua, Pa., has accepted a position as manual training instructor in the high school at Slatington.

Mr. R. J. Caryer of Sheboygan, Wis., has been appointed as director of the vocational school at Stevens Point. He succeeds G. J. Ehart, who has gone to Janesville.

Mr. W. C. Spratt of Aurora, Neb., has been employed to teach manual training at Shenandoah, Ia.

Miss Elizabeth Ennis, an instructor in the vocational school at New Bedford, Mass., died at her home in that city on August 3rd, after an illness of more than six months with heart disease. Miss Ennis, who received her training at Simmons College, Boston, had been for some time in charge of the sewing classes in the day and evening schools.

Dr. William H. Smiley, for the past nine years assistant superintendent of the Denver public schools, has been made superintendent of schools emeritus by the Board of Education in recognition of his long years of service. Dr. Smiley will remain in active service for the Denver schools. He will have charge of the administration of the Smith-Hughes work, many of the publications of the school system, and will have an important part in the shaping of policies of the Denver schools.

Mr. Ralph F. Morrison has been appointed shop foreman in the Boston Trade school, Boston, Mass.

Mr. Thomas C. Walsh, shop instructor in the Boston Trade School, has been placed upon the maximum salary of the schedule for his rank, namely $2,268, for the coming year.

Mr. George F. Hatch, formerly junior master at the Brighton High School, Boston, Mass., has been made assistant director of the manual arts department; **Bertha Pettee** has been made instructor in manual training, and **William H. Powers,** instructor in shop work.

Mr. Gardner Hart of San Diego, Calif., has been appointed as instructor in electrical work at the Union High School, Huntington Park.

Mr. Leroy Davison of Fort Scott, Kans., and **Mr. G. C. Peterson** of Cherokee, Kans., have recently been appointed as manual training instructors at Leavenworth, Kans.

Mr. B. T. Bullen of Garden City, Kans., has accepted a position as head of the household mechanics department of the Sherman Junior High School, Denver, Colo. Mr. Bullen had been head of the Garden City Manual Training department for the past five years.

John M. Bice, director of Manual Arts in the Fort Dodge, Iowa, schools, announces that a course in printing has been added to the curriculum of the Junior High School. Woodwork, forging, electricity and cement work are a part of the course in the school.

Unit Courses in Brick-Laying. Series X, No. 16, of the vocational short courses issued by the Smith-Hughes Vocational Department, Kansas State Teachers' College, Pittsburg. The material is issued in loose-leaf form for insertion in a notebook. It outlines the methods of instruction, the material necessary for instruction, and offers directios for mixing and handling mortar, laying a brick wall, building a flue, jambs, corners and angles, laying up walls over openings and arches, laying up Flemish bond, running a bond for veneering, and how to proceed in chimney and mantel construction.

Service to Vocational Instructors. Simple Lesson Planning, Series IX, of the Smith-Hughes Vocational Department, Kansas State Teachers' College. The material is in looseleaf form and is intended to help prospective teachers see the need of lesson planning and to outline a simple method. Among the subjects covered are simple lesson planning, explanation of methods, building upon knowledge, use of chalk and charts, planning of time, records, personal appearance and conduct.